MID-TERM ASSESSMENT

ON-FARM SEED PROJECT

AID/PVC MATCHING GRANT

OTR-0290-A-00-7203-00

Winrock International Institute for Agricultural Development

October 1989

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November 7, 1989

Mr. Harry Wing
Chief, FVA/PVC/PD
USAID
Washington, D.C. 20523

Subject: Mid-term evaluation of the On-Farm Seed Project
OTR-0290-A-00-7203-00

Dear Harry,

Attached find 12 copies of the cited mid-term evaluation which was completed by Mr. David Smith.

We are impressed with the objectivity and thoroughness of his report and the usefulness of recommendations made. This report will be very helpful to us in making mid-term project adjustments and in the future planning of other technical service activities.

Also may we express our appreciation and satisfaction with the interest of your office and the assistance you, Ted Fields, Tom Marchione, and Shane MacCarthy have provided in advancing the On-Farm Seed Project.

We look forward to our continuing collaboration and stand ready to assist you as needed in the development of PVO/NGO programs.

Sincerely,

Ned S. Raun
Regional Representative
Washington

cc: Tom Osborn
Valerie Lamont
Pierre Antoine
Hank Fitzhugh
D. S. Athwal
R. D. Havener

NSR:valm

MID-TERM ASSESSMENT
of the On-Farm Seed Project
Sénégal and the Gambia

Winrock International, Washington, D.C.
Joint PVO/University Center for Rural Development, Cullowhee, N.C.

18 October 1989

Matching Grant OTR-0290-A-007203-00
Office of Private and Voluntary Cooperation
United States Agency for International Development

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INTRODUCTION

The preparation of this Mid-term Review of the On-Farm Seed Project was made much easier, more constructive and more valuable by the candor and supportiveness of the collaborating organizations. As the grantee, Winrock in particular set a tone of inquiry and a desire to learn about a potentially valuable approach to technology transfer.

The staff was extremely generous in making themselves and every possible source of information and every contact readily available. Special thanks are due to Dr. Ned S. Raun, Regional Representative of Winrock International in Washington, and Valerie Lamont, the Washington Program Assistant. Tom Osborn, the OFSP Project Leader, was equally forthcoming and took great pains to arrange a demanding and fascinating field visit that took the Evaluation Team from Dakar to Ziguinchor by way of villages, rice fields and administrative offices. The staff of The PVO Center and Mississippi State University were equally helpful.

The Scope of Work of the Assessment was a concise, thoughtful document, jointly produced by Winrock and PVC, that focussed the assessment on issues of genuine importance. PVC staff were as committed as OFSP staff to making the assessment an opportunity for growth and a source of direction for the remainder of the project.

The serious search for solutions and commitment shared by all actors in the project bode well for its impact on the lives of small-scale farmers in Africa.

David A. Smith
Washington
18 October 1989

I. EXECUTIVE SUMMARY

The Mid-term Assessment of the AID Matching Grant to Winrock International for the On-Farm Seed Project in Senegal and The Gambia was carried out over one month in September and October 1989. The objective of both AID and Winrock in completing the assessment was to refine management tools to guide implementation for the remaining two-and-one-half years of project life.

To that end, Winrock and the Office of Private and Voluntary Cooperation jointly prepared a very thorough Scope of Work, primarily addressing the institutional aspects of the project. The OFSP is seen by both AID and Winrock as a pilot effort to derive useful models for bringing the essential agricultural technologies "downstream," to the small-scale African farmer. For this reason, its lessons have implications for the future strategies of both AID and Winrock. The potential lessons motivated AID to support the OFSP despite the "high risk" nature of its collaborative design.

The Scope of Work, based on the Logical Framework of the Matching Grant Proposal, directed the Evaluation Team to assess:

- the "process" approach of the project as a valid means of implementation and basis for an on-farm seed production model or methodology;
- the degree and kind of participation in the field of project collaborators and the development of seed production networks;
- the training and technical assistance activities of the project;
- the technical component of the project;
- project administration and logistics.

Among the significant conclusions or lessons that can be derived from the assessment are that:

- the OFSP is providing a valued service to small farmers in the target countries;
- the participatory process approach can be used to transfer a range of agricultural technologies to small-scale farmers;
- there is reason to believe the on-farm model has application elsewhere in Africa;
- there appears to be a strong likelihood the on-farm model will achieve sustainability in Sénégal and The Gambia.

The innovative and experimental nature of the OFSP extends beyond its field impact. It also is significant in the context of the changing roles of US PVOs. It explores transfer of state-of-the-art technological resources from highly-respected Northern institutions with minimum operational presence. Though the complex collaborative arrangement among Winrock, Mississippi State and The PVO Center has not been without its problems, both the OFSP's success and its failures provide useful lessons. The most important is that the low-profile technology transfer design requires a preliminary phase of systematic and participatory planning involving all the potential partners in the field and in the US. In the long-term, such planning will result in a more integrated, efficient and cost-effective use of the institutional resources of all participating organizations. The initial OFSP design did not adequately anticipate the need for planning.

Another important lesson, based on conversations with local informants in The Gambia and Senegal, is that the OFSP and indeed PVO activities in general, must increasingly judge their work by how well and how quickly they are creating conditions where host country institutions are able to solve their own problems using their own expertise. This is the central challenge for the OFSP in the ensuing two-and-one-half years.

Certain critical elements have contributed to the success OFSP has enjoyed in The Gambia and Senegal. Four appear to be essential:

- "on-farm" point of entry;
- collaborative, participatory, non-operational modality;
- solid expertise;
- minimal staffing.

They are best summarized as minimal design. The OFSP promotes low input appropriate farming technology to the end user and makes use of existing institutional resources rather than duplicates them. It is very significant that the lean administrative structure of the model acts as a natural brake on the institutional tendency do the job rather than transfer skills.

The OFSP is up and running. With judicious attention to anchoring the concept of on-farm technology transfer model organically into the development structures of the host countries, there is every reason to expect it will provide a permanent and valuable new technical assistance resource to small-scale farmers and their support institutions. The evolution of the project also will continue to provide important points of reference to the US PVO community as it seeks to make itself more relevant and effective in a changing development environment.

II. PROJECT DESCRIPTION AND CONTEXT

The On-Farm Seed Project (OFSP) is a collaborative effort of Winrock International (Winrock) in cooperation with The Center for PVO/University Collaboration in Development (The Center) and the Seed Technology Laboratory at Mississippi State University (MSU). The project is funded by an AID Matching Grant from the Office of Private and Voluntary Cooperation. Winrock is the grantee. The OFSP is overseen by an Advisory Committee of representatives of Winrock, The Center, MSU, Peace Corps and participating US PVOs (see Appendix A). It is viewed by all participating institutions as a pilot project, an attempt to make the technical expertise of important agricultural development institutions available to the small-scale farmer through institutions that work at the grass roots.

Funding for the OFSP was approved in May 1987. Staff was hired the following August. It is a five year project, budgeted at $1.8 million for the period, and scheduled to end in 1992. Winrock provides approximately two-thirds of the required match, the PVO Center the remaining one-third. Thomas Osborn is Project Leader (see Appendix B), assisted by Valerie Lamont, a Program Assistant based in the Winrock Regional Office in Washington, D.C. Dr. Ned S. Raun, Winrock Regional Representative, is Program Manager.

As originally conceived, the OFSP was a US-based technology transfer mechanism, working through field-based US PVOs convened by the The Center. The design of the OFSP reflected Winrock's experience with an earlier PVC Matching Grant for providing technical services to PVOs. Called "Technical Services in Animal Agriculture to PVOs," the project provided technical assistance in livestock to PVOs worldwide for Winrock's US base. The project was viewed as innovative for several reasons, among them:

- the collaborative nature of the design;
- the attempt to marry strong technical expertise to grass roots agricultural interventions;
- the "on-farm" point of entry for seed technology.

The attempt to mount a technology transfer project without the full on-site PVO infrastructure was a positive step for AID and for the collaborating organizations. It came at a time when Southern NGOs were asking that external organizations learn new ways to transfer their technology and information while leaving implementation to indigenous groups. Because of institutional interest on the part of AID and the Peace Corps in working more closely together, the OFSP included Peace Corps as a second target clientele.

The countries of operation were not identified in Winrock's initial proposal. Sénégal and The Gambia ultimately were chosen on the basis of conversations in the US and cabled and written inquires to the field. Cameroun was one of the other African countries originally considered. Both Sénégal and The Gambia had been identified by the Peace Corps for

implementation of its African Food Systems Initiative (AFSI) and both have a significant community of NGOs.[1] The choice of Sénégal and The Gambia was fortuitous because both countries are attempting to privatize their seed industries after several decades of subsidizing agricultural inputs. This radical change in policy has required a major shift for agricultural producers at all levels. For the small farmers who are the focus of the OFSP, it has meant reviving and learning seed selection and storage practices unused in at least a generation. Neither country has strong agricultural extension, particularly for small farmers.

The Gambia is a small English-speaking country of under one million in population stretching into the middle of Sénégal along The Gambia River. It is surrounded by Sénégal, a francophone country with a population of approximately seven million. The Sénégambia federation, created in the early 80's, recently was terminated. Though the federation generally is conceded to have had little benefit for either country, the termination will have negative economic effects on the The Gambia, especially on the value of its non-convertible currency, the Dalasi, and therefore on its agricultural earnings. Sénégal uses the CFA, which is backed by the French franc.

Though Sénégal and The Gambia enjoy a considerable degree of defacto economic integration by virtue of their geographic proximity and cultural similarities, for purposes of this assessment, the OFSP in the two countries should be considered as separate. There is more to be learned from viewing the differences in application of an on-farm technology transfer model in two different contexts than from viewing the project as a whole.

The key US PVOs with which Winrock expected to collaborate were Catholic Relief Services (CRS) and Lutheran World Relief (LWR) and Save the Children (SCF). CRS has offices in both Sénégal and The Gambia. The Gambia is host to several large external NGOs in addition to CRS and SCF, including Freedom From Hunger (Germany) and Action Aid (Great Britain). In The Gambia, external NGOs comprise a significant part of extension services to small-scale farmers. Its community of indigenous organizations is small.

Sénégal, on the other hand, has a very strong community of indigenous organizations and a significant population of external NGOs, but relatively few US PVOs. It also happens that Sénégal is a leader of the Southern NGO movement in Africa. The Forum of African Voluntary Development Organizations (FAVDO), the pan-African consortium of NGOs, was founded in Dakar in 1987. Several of its most influential leaders are Sénégalese.

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[1]The nomenclature for the private voluntary sector in Africa can be confusing. What are called Private Voluntary Organizations in the US, generally are called non-governmental organizations in Africa. In the current context, the useful distinctions are between "external" organizations--those which have a foreign, usually Northern, base--and those which were formed locally, within a given country, and are registered there. For the purposes of this assessment, the term "NGOs" should be understood to refer to the entire private voluntary community. Where a distinction between external and indigenous is necessary, those adjectives will be used. Where US organizations are referred to specifically, they will be called "US PVOs."

Both CRS and LWR are responding to current thinking on the role of external organizations and altering their programmatic approaches accordingly. LWR recently closed its Dakar office and will work through Sénégalese NGOs it has identified as partners and to which it will provide financial support. CRS, in a culmination of a major shift of emphasis underway for several years, is in the process of moving away from its operational role to one which also places greater emphasis on local institutions.

Thus, even in the two years since its inception, the context for the OFSP has altered. The current climate will require greater emphasis on relationships with indigenous organizations and on helping them increase their capacity to absorb technical inputs.

Changes

There have been a number of significant changes in the design of the OFSP since it was approved. The most far-reaching is that the US Advisory Council determined during the last year that successful implementation required an in-country presence. As a result, the Project Leader, who had been based in Washington, has been posted to the field and now maintains an office in Dakar. In addition, a second full-time staff person has been hired as Sénégal Program Coordinator. He is Alphonse Faye, a highly qualified rice breeder who has spent his career working for the Government of Sénégal's Institut Sénégalais de Recherche Agronomique (ISRA) (see Appendix C). M. Faye brings a wealth of experience and credibility to the position coupled with a commitment to bringing appropriate practice and agricultural technology to small-scale farmers. He will be an asset to OFSP, particularly as it expands its contacts with NGOs. A part-time administrative assistant will shortly be hired for the Dakar office.

Another significant change is that US-based support, which has been provided from the Washington regional office, will be shifted to Winrock's headquarters in Morrilton, Arkansas, beginning 1 January 1990. This decision was finalized at the internal review of the OFSP which was held July 6 and 7, 1989, at Winrock Headquarters. The rationale for the decision was to integrate the OFSP, which reflects a central part of Winrock's institutional strategy, into other Winrock programming initiatives. Back-up support for the OFSP will be provided at 50 percent time by Steve Grant, Program Assistant in the Africa Division of Winrock Headquarters. The Program Manager's role will be assumed by Pierre Antoine, Program Officer for West Africa. The Washington-based Program Assistant's position will be terminated. Dr. Raun will continue to provide Washington liaison with Peace Corps and PVC.

III. EVALUATION METHODOLOGY

Though the Mid-term Assessment of the OFSP originally was scheduled for the end of Year Three, Winrock and PVC jointly decided to carry it out earlier. The major reason for the change was to enable the results of the assessment to serve as a management tool for the remainder of the project. The assessment used a very thorough Scope of Work jointly prepared by PVC and Winrock staff (see Appendix D). The Scope of Work used the original logframe of the proposal as its basis and states as the purposes of the assessment to:

- study activities and examine issues of the OFSP from its beginning;
- assess progress toward project goals;
- assess logframe and revise as necessary;
- recommend direction and scope of activities for remainder of project.

The Scope of Work identifies five areas of inquiry. They are to assess:

- the "process" approach of the project as a valid means of implementation and basis for an on-farm seed production model or methodology;
- the degree and kind of participation in the field of project collaborators and the development of seed production networks;
- the training and technical assistance activities of the project;
- the technical component of the project;
- project administration and logistics.

The assessment was a collaborative effort of a team including an Evaluation Specialist, who functioned as Team Leader, and Dr. Raun assisted by Mr. Osborn and Ms. Lamont. Emphasis was laid on the institutional aspects of the project. As a result, the Team Leader selected was David Smith, whose background is in non-profit management and institutional development. His point of view was augmented with technical input from Dr. James Delouche of MSU and interviews with seed experts in the field, including Claudio Bragantini, Seed Specialist with the USAID/S Agriculture Production Support project (APS), and others.

The assessment was carried out in three segments. The first was a week in Winrock's Washington Regional Office where the Team Leader reviewed more than 30 documents relating to the project (see Appendix E) and interviewed several members of the OFSP's US Advisory Council. The second segment was a two-week field assessment in Sénégal and The Gambia (see Appendix F), where the team interviewed a range of interested individuals and organizations, visited several villages where field trials and other project activities were in process and spoke first hand with farmers, Peace Corps Volunteers, and other project participants. The third segment of the assessment was preparation of the report, which was written at the Winrock Regional offices in Washington.

In the course of the assessment, the team interviewed a total of 50 individuals whose views on the OFSP were pertinent. (See Appendix G). Interviews centered on five broad questions derived from the Scope of Work

and predicated on the assumption that both AID and Winrock invested resources in the OFSP as a pilot effort to explore new approaches to the cost-effective, efficient transfer of technology. It was assumed that neither AID nor Winrock would be in a position to provide similar amounts of support to OFSP beyond the life of the project and that the relevance and long-term sustainability of the OFSP were the fundamental points at issue. Interviews emphasized these five questions:

- Is the OFSP an appropriate use of US Development Assistance funding and of the private resources of a US PVO?
- Does the OFSP meet a need in the target countries? Is the approach relevant to small-scale farmers?
- Does it have applications beyond Sénégal and The Gambia?
- Is it sustainable? and, if so, in what form?
- What should be priority activities over the next two-and-one-half years in order to assure sustainability?

IV. EVALUATION NARRATIVE

A. Achievements

The OFSP has achieved or exceeded the targets set forth in the Logical Framework of the proposal. They include:

- a central role in design of the AFSI program for Peace Corps/Sénégal;
- an ongoing training and technical assistance relationship for 12 current AFSI Volunteers and new Volunteers as they arrive; an ongoing training and technical assistance relationship to key seed players in The Gambia including CRS, Save the Children, Action Aid, FAO;
- periodic scheduled training to approximately 20 Gambian extensionists and senior agricultural staff of NGOs;
- six seed varieties identified (3 rice, 3 millet), tested and identified for promotion as appropriate;
- peanut storage techniques tested and results disseminated;
- OFSP Advisory Councils operational in The Gambia and Sénégal;
- a model for replication outlined based on project experience;
- two formal training materials produced in addition to publication of Seed Sowers newsletter as well as various less formal reports, training syllabi and discussion papers.

The potential impact of OFSP is considerable. In its current collaborative arrangements it is working with 12 Peace Corps Volunteers, each working in approximately three villages in Sénégal with populations ranging from 500 to 1500 persons who can be considered indirect or potential beneficiaries or project activities. Peace Corps Volunteers are engaged in direct activities with a total of 100 farmers.

In the Gambia, OFSP is working consistently with approximately 25 NGO, government and FAO extensionists. Each of these extensionists is responsible for three to ten villages. Village populations range from 500 to 2000.

B. General Observations

Some general reactions, based on questions put to interviewees, will provide a framework for specific conclusions about the five focus areas in the assessment Scope of Work.

Is the OFSP an appropriate use of US Development Assistance funding and of the private resources of a US PVO?

The OFSP should be judged, as should most external development efforts, against the standard of one highly-respected Sénégalese informant who, asked whether the OFSP was an appropriate use of development resources, said, "development projects are useful to the degree that they enable developing countries, as quickly as possible, to make us use their own resources."

In some respects the OFSP meets this standard. It emphasizes building the skills and awareness of local development practitioners, though this is less true in the case of Peace Corps than with NGO and government agriculture extension personnel. The OFSP methodology places heavy emphasis on existing knowledge, particularly that of the small-scale farmers it serves. It takes advantage of existing entities and supplements rather than competes with their services. There are two very positive aspects of the project.

The OFSP is a highly participatory methodology and an inventive attempt to make technology available to the grass roots without undue operationality. Because events have caused it to assume a larger in-country profile than initially was intended, some of the original assumptions have not been tested as well as they might have been. Nevertheless, the project deserves close attention and bears refinement and replication.

With the addition of the Sénégal Program Coordinator, the OFSP is providing an opportunity for one of the region's foremost agriculture experts to learn a methodology of technology transfer which could have far-reaching benefits for small farmers. Involving an indigenous staff person of the stature of the Sénégal Program Coordinator is a significant way to help Sénégal make relevant use of its own resources. In light of the occasional reluctance of external organizations to provide this kind of enablement for local expertise, the OFSP can even be viewed as courageous.

Does the OFSP meet a need in the target countries? Is the approach relevant to small-scale farmers?

There can be no question that the OFSP meets an important need. The best indicator of this is the participation of farmers, NGOs and host governments, as well as the Peace Corps. The Gambia and Sénégal are not unique in Africa in having weak, undermotivated agricultural extension services and in lacking the knowledge and the resources to provide extension, especially at the grass roots. Farmers are eager for accurate, appropriate and consistent information about farming practices. This is particularly true of seed, at present, in light of farmers' being obliged suddenly to provide their own seed after years of government subsidy of inputs.

The consistency of the OFSP's approach is one of its most important characteristics. Small farmers are at the end of the technology pipeline and suffer more than any other segment of the agricultural community from swings in agricultural fashion. Seeds are a case in point. When new varieties are being emphasized nationally, small farmers are pushed along with the rest of the community to use them. Often they lack the resources to purchase them in adequate amounts, the knowledge of how, when and where to use them and even the ability to be sure they are getting seed of good quality. Their output suffers.

Uniquely, the OFSP defines small farmers as its clientele and provides technical advice appropriate to their needs. It tests seed innovations in small farm conditions and promotes only those that can be demonstrated as useful in that context. The OFSP provides its services through organizations and personnel who are, by comparison to many development efforts, permanent parts of the agricultural scene.

Does it have applications beyond Sénégal and The Gambia?

There is every indication that the OFSP methodology, for seed, and more generally for the transfer of a variety of agricultural technologies, has application in a variety of African settings. Evidence of this is an inquiry to OFSP about the possibility of assistance to LWR's work in Mali (see Appendix H). Peace Corps/Washington is interested in exploring on-farm the concept in Ghana. Expansion over the next two to three years beyond Sénégal and The Gambia to contiguous countries would be worthwhile. Expansion would make the OFSP more cost-effective and emphasize the "technical support" nature of the concept, diminishing any tendency to establish a free-standing entity providing service rather than periodic technical underpinning. Expansion also would enable the OFSP to broaden its technical capacity from experience on a regional basis and at the same time share the benefits of its own initial experience. A broader geographic base would increase funding possibilities and so the likelihood of long-term sustainability.

Is it sustainable? If so, in what form?

Taking the definition of sustainability as the continued flow of benefits supported by whatever source, it is fair to say the OFSP has a good chance of achieving sustainability. The major reason is that it meets a clear need. As a result, there are several different clienteles that can be expected to take an interest in seeing that its services continue to be available.

The OFSP has been an invaluable technical assistance resource to Peace Corps/Sénégal at no cost. Assuming continued emphasis on AFSI, the Peace Corps may in the future be willing to pay for some of the training it receives. FAO's Fertilizer Project in The Gambia, which has been a major beneficiary of OFSP services, has indicated a willingness to pay for training in the future. Similarly, PVOs that are beneficiaries of OFSP are likely to be willing to purchase expertise of OFSP or its successor. AID Missions in both countries are supportive. They probably will be willing to consider "buy-ins" through their agriculture and PVO projects as might Missions in countries to which the OFSP expands. Multilaterals like The World Bank and UNDP both are increasingly interested in grass roots transfer of agriculture technology and are possible sources of future support.

What should be the priority activities over the next two-and-one-half years to assure sustainability?

The chief task for the OFSP between now and the end of the current project will be to institutionalize the demand for the methodology so that the current clienteles have a vested interest in seeing the service continue. This will be particularly important within the indigenous NGO community of Sénégal, where the project has been least active to date. This means making the OFSP's services readily available to indigenous NGOs and helping to ensure that the organizations using its services have sufficient infrastructural capacities to absorb and use OFSP technical assistance.

The most promising sustainability strategy for the OFSP is to pursue a variety of possible funding sources, building on the credibility it already

has established and on the institutionalization it establishes during the remainder of the life of the project. It does not seem likely that one donor would be willing to support the entire project as AID, Winrock, and The Center presently do. OFSP should be alert to a range of possibilities for future financial support and to various possible institutional incarnations for the OFSP. The institutional shape of a sustainable OFSP will depend as much as anything on the forms of long-term financial support that emerge. There are a variety of options for a sustainable OFSP-like project in the future. Among them are:

- an externally-based Winrock program, funded from a variety of sources, functioning somewhat like a technical assistance consultancy for one, two or several contiguous African countries;
- "indigenization" of OFSP as an Africa-based technical assistance resource, free-standing or as a part of an existing NGO;
- an Africa-based resource emerging from one or more of the current OFSP Advisory Councils and managed as a consortium;
- management assumed by one of the current target groups like CRS or Save the Children;
- institutionalization of the concepts of on-farm technology transfer with a sufficient number of existing institutions that there is no longer a need for a separate vehicle.

The task, for OFSP, to assure sustainability, will be to maintain the relevance of its services, to anchor itself securely in the community of institutions serving small-scale farmers and to be alert to possibilities for supplementary or alternative funding. As long as it remains sensitive to the fundamental requirement that its efforts should serve, first of all, to enable clients to use their own expertise, the form of a sustainable OFSP matters less than judiciously building the resources to support it.

C. Assessment Objectives

1. Assess the "process" approach of the project as a valid means of implementation and basis for an on-farm seed production model or methodology.

The "process" approach of the OFSP is understood by Winrock and the Project Leader as "determining the scope and nature of activities based on identified needs of the clientele and designing interventions accordingly." This really is nothing more than the participatory approach which ought to be a part of any development project, but often is not. Winrock scrupulously has observed the participatory approach in design and implementation of the project.

Because the OFSP relies so heavily on collaboration of other organizations, the project has had to be flexible, responsive and participatory in order to have anyone to work with. The most persuasive indicator of the validity of the "process" approach is that the OFSP has established several clienteles that value the quality and relevance of its training. Involvement of the Peace Corps AFSI program in Sénégal, NGOs in The Gambia and, most importantly, farmers in both countries, who eagerly participate in field trials and field days, indicates the project is filling a need.

Essential Elements

Judging from its success in The Gambia and Sénégal, the OFSP is a useful model for the transfer of agricultural technology. If so, what are the elements to replicate? There are four that are essential:

- "on-farm" point of entry;
- collaborative, participatory, non-operational modality;
- solid expertise;
- minimal staffing.

Perhaps more important even than the so-called "process" approach is that the OFSP brings technology "downstream" to the small peasant farmer. Typically, agricultural technology, particularly in the rarefied area of seed varieties, is shared only with a few large agricultural operators or, all too often reaches no one. Thus, the nexus of the small farmer and technology--targeting interventions "on-farm" at the beginning of the chain--is where the real value of the model lies.

"On-farm" is the operative word, not seed, though seed. The OFSP itself already has moved from introduction of seed varieties and seed selection to successful storage of seed and inevitably will move from storage of seed to storage of grain. Seed, needless to say however, is so basic to agriculture that it is the necessary starting point for an on-farm approach to agricultural technology transfer.

The aim of the OFSP is to provide technical expertise to complement the activities of PVOs, NGOs and the Peace Corps. These collaborating organizations are the implementers. The OFSP confines itself to a narrow, essentially non-operational sphere. Such a supporting role is appropriate for an external NGO at the current point in the "North-South dialogue."

Genuine technical expertise is important to the success of the on-farm model. Key staff must know what they are talking about. The OFSP brings technical expertise and its accompanying credibility in three different ways: through Winrock's longstanding institutional capability in agriculture, through the association with Mississippi State University and the technical competence and background of the Project Leader. The substantive expertise the OFSP offers is the reason it has been able to establish collaborative relationships with important development players in Sénégal and The Gambia. At the same time, building the necessary linkages for on-farm technology transfer requires considerable administrative and representational finesse. Those skills also must be present for the model to be successful. As the OFSP increases its interaction with indigenous organizations it will be necessary to broaden its ability to provide non-technical institution-building services to maximize the absorptive capacity of its clientele.

Partially by design and partially by happenstance, the OFSP has, until now, been a one-person show with US-based logistic support. By necessity, therefore, the project has had a light touch. There has been no possibility of overinvolvement in the operations of collaborating organizations and no way OFSP could be tempted to carry out project activities that were the responsibility of client organizations, cooperating farmers or others. The

Project Leader had no choice but to collaborate and elicit the involvement of target groups. The limited staffing puts genuine responsibility on Advisory Councils. Replications also should minimize staff. However, if they are based in-country, on-farm projects require at least one full-time technical person per country with adequate in-country logistic and administrative support. Additional staffing should be considered very carefully.

Data Collection and Baseline Data

The collection and analysis of data, which was part of the original project proposal and was to have provided monitoring benchmarks, has not taken place. The proposed system was elaborate and presumed, among other things, a formal survey of farmers in Sénégal and The Gambia, to be carried out by the staff of collaborating organizations. The expectation that PVOs would commit their staffs to such an undertaking or that newly-arrived Peace Corps Volunteers could carry out such a sophisticated activity, proved to be over-optimistic. As a result, formal data collection was not carried out.

The proposed data collection and analysis probably was unnecessarily ambitious, but in its absence, the OFSP has no basis against which to measure progress and impact. This is not to say that it is not generating useful information and, in fact, using it in defining appropriate interventions. Rather it is to lament that the project is generating valuable information which is going unrecorded.

At present, there is no systematic plan for codifying information in a form that would enable progress to be measured or facilitate learning. The OFSP is dealing with the farming systems of The Gambia and Sénégal at a level and in ways that are unique. Some of the information being generated on traditional practices, production capacity, gender roles and the behavior and expectations of small rural farmers has wider importance. It should be captured and used outside the program to deepen the understanding of agricultural issues in the target countries and elsewhere.

Materials Production

A somewhat related issue is that the OFSP has not, as yet, found a satisfactory way fully to meet the programmatic obligation to produce meaningful technical and training materials. It is not surprising in the first two years of operation that materials have not been the highest priority of the Project Leader. What is surprising are the project's accomplishments in materials production to date. In cooperation with the Seed Technology Unit of the Government of The Gambia, the OFSP has produced and distributed 600 copies of a Seed Multiplication Agriculture Manual for Extension workers in The Gambia. In cooperation with MSU and the PVO Center, the OFSP has produced The Seed System, Seed and Grain Storage, a two volume collection of materials on seed for use in training. Four issues of the newsletter Seed Sowers been produced and distributed to a mailing list of 400.

However, there are a variety of materials for which the Project Leader has identified a need but not the time for or means of production. Among them are simple "how-to" training materials for NGO extensionists, a manual for

implementing on-farm agriculture technology transfer and formal reports of OFSP field trials.

Materials production to complement and reinforce training of agricultural extensionists, to broaden the understanding of peasant farming practices in The Gambia and Sénégal and to make available more widely the successful aspects of the "on-farm" approach is an important project output. This is all the more true with the addition of the Sénégal Program Coordinator, who brings not only his international reputation as an eminent rice breeder but, as a Sénégalese, a valuable cultural comprehension. Unusual for so highly-skilled a specialist, he is strongly committed to bringing technology to the farmer. His presence presents a unique learning opportunity. Additionally, the nature of the OFSP demands that as much of its work as possible be made accessible to potential users and that its trainees be equipped permanently to pass on what they learn.

Many of the ingredients necessary for materials production are present in the OFSP, not the least of which are the research and production capacities of Winrock. There are several options for increasing the materials production capacity. Among them:

- consider abandoning Seed Sowers in favor of more time and resources for other materials production;
- reorient Seed Sowers so that it becomes itself a vehicle for recording and disseminating appropriate technical information;
- take advantage of additional staff capacity to allocate more time to materials production;
- seek small, discrete grants for production of specific materials; use Matching Grants to involve collaborating organizations in producing relevant materials.

2. Assess the degree and kind of collaboration in the field of project collaborators and the development of seed production networks.

The project has as many effective collaborative relationships in the field as it can handle at present and as many as it could have been expected to have after two years. The Advisory Councils, especially the one in The Gambia where the OFSP's work involves PVOs, are strong and provide genuinely useful fora for exchange of information about seeds in particular and agriculture in general.

In The Gambia, the OFSP is providing ongoing training and technical assistance to the extension staff of several external PVOs and the Food and Agriculture Organization (FAO), all of which are actively involved in the seed system of the country. Relationships are positive and the OFSP is viewed as a valuable technical assistance resource. OFSP is involved with SCF, Action Aid, Freedom From Hunger, and CRS. All of these organizations carry out integrated development programs in which the agricultural components are significant. They are a central part of the agricultural extension system in The Gambia. It is GOTG policy to allocate specific areas of the country for the work of various external organizations, so there is little overlap among PVOs. There is not as yet a significant indigenous NGO sector in The Gambia. The Association of NGOs (TANGO), is a fledgling consortium organization which is not particularly active.

In Sénégal, OFSP has worked primarily with the Peace Corps and has been an invaluable technical resource in the design of Peace Corps/Sénégal's AFSI program. AFSI is an integrated effort by the Peace Corps in selected African countries to address food production needs through the recruitment and placement of clusters of Volunteers with complementary skills. AFSI programs reflect a long-term commitment by Peace Corps to specific programs in specific geographic and programmatic areas. The aim of the AFSI program in Sénégal is, among others, to improve existing food stocks. Grain storage and seed selection and storage are two major emphases.

The Peace Corps/Sénégal APCD is not an agriculturalist by background and relied heavily on the OFSP Project Leader in the design of the AFSI program. It probably is fair to say that that AFSI/Sénégal's emphasis on seed is owing to the collaboration between the Peace Corps and OFSP in program design. At the same time, the 12 AFSI Volunteers in the Nioro and Bignona Departments of Sénégal have been an important resource to OFSP in conducting rice and millet field trials and peanut storage trials, as well as in organizing field days to demonstrate results.

AFSI in The Gambia is not concerning itself with seed. The program will consist of two demonstration vegetable plots. The assessment team was not able to meet the staff of Peace Corps/The Gambia personally because they were travelling in connection with the annual country tour of The Gambia's President Sir Dawda Jawara. In a later telephone conversation, the APCD for AFSI/The Gambia confirmed there was little likelihood of Peace Corps collaboration with OFSP, at least in the short term.

Early Project Implementation

That the OFSP is on target two years after staff first was hired does not mean that it was launched easily or that early planning and design were undertaken with adequate care. On his arrival in West Africa, the Project Leader was met with lack of interest, incomprehension and even hostility from the organizations he expected would be awaiting him as collaborators. The assumption, on the basis of several encouraging cables from the Peace Corps and AID, that collaboration would be easy to bring about in the field or that the field offices of US PVOs would share the enthusiasm of their agency counterparts on the US-OFSP Advisory Committee, was over-enthusiastic.

The approval process for the OFSP Matching Grant did not allow for adequate pre-implementation planning, resulting in a difficult beginning for the project. AID, Winrock and The PVO Center each share some of the responsibility. Having tentatively approved a project in which the countries of operation were yet to be identified, AID should have required stronger evidence that collaborative linkages were in place in the countries finally selected, especially since none of the principals had operations in either The Gambia or Sénégal. Having recognized after its initial visit in May 1987 that collaborative relationships were weak, Winrock should have moved more decisively to address the problem. The PVO Center, as the convenor of the Advisory Council and of the US PVOs, should have moved more quickly to try to strengthen the linkages.

The added effort required of the Project Leader to function without the basic logistic support was wasteful of time and resources. Since the project is now functioning effectively, the foregoing comments would be academic if the OFSP were not considered a pilot project with potential for replication. It is doubtful a second project, developed along the lines of the OFSP, would be functioning two years later. That OFSP now is relatively successful is owing to the doggedness of the Project Leader and some happy coincidences of institutional need. Peace Corps/Sénégal needed technical input in designing its AFSI program. The Gambia is a rare country in which seeds are an established part of the overall development efforts of the NGO community. These were the important footholds for the OFSP in its early days. It is not likely such serendipity would occur on a second occasion.

To avoid some of the OFSP's initial problems, replication should involve a process in which:

- country selection is made on the basis of a thorough, in-country analysis of needs and resources;
- implementation is preceded by an in-country planning phase of six months to one year;
- linkages are established by involving potential collaborating groups, in the US and in the field, early and integrally in planning;
- adequate logistic and administrative support for project staff is ensured in advance, probably through a collaborating organization to enhance credibility.

As a result of its rocky beginning, and more than anything else to the failure to involve potential collaborating organizations in planning, the OFSP is now field-based rather than US-based and both the project and Winrock have a much higher profile in the host countries than was contemplated. Winrock is a government-registered PVO operating in Sénégal with an office, a telephone and a car. This may or may not have been necessary. In this case, it was unavoidable. As a result, the opportunity to test the original model, where Winrock would field the OFSP's narrowly-targeted technical expertise from the US, relying on already-established organizations to provide field support, was lost. That design is an interesting response to the call by Southern NGOs for lower operational profiles by external organizations. The US-based model would have been cheaper to operate, have stimulated a greater degree of local ownership and would have prevented another US PVO's setting up shop in Africa at the moment when the trend is in the opposite direction. Such a model for technology transfer deserves another, more thorough hearing.

NGO Strategy in Sénégal

OFSP is not well known in Sénégal outside the Peace Corps. Even people who are aware of its existence do not know its purpose or what services it offers. At the same time, the Sénégal NGO community is essential to the future of the OFSP. OFSP is embarking on a strategy to involve itself more directly with the NGO community. The long-term survival of the OFSP model will depend on the degree to which the project is viewed as relevant by NGOs and host governments. Because Sénégal is a leader internationally in the Southern NGO movement, strong linkages with the NGO community are necessary

to the credibility of the OFSP and of Winrock, not only in Sénégal but generally in Africa.

Winrock already is a member of Conseil des Organisations non-Gouvernamentales en Appui au Developpement, the 65 member consortium of external and indigenous NGOs in Sénégal (CONGAD). CONGAD is represented on the Sénégal OFSP Advisory Council. Preliminary representations about OFSP have been made to the current CONGAD President and individually to members of the Executive Committee. The next step will be a formal presentation to the CONGAD Executive Committee and then identification of specific CONGAD members whose field-level needs lend themselves to OFSP assistance. As such organizations are identified, they will be invited to join the OFSP Advisory Council. One member of CONGAD which seems a likely collaborator is the Fédération des Organisations non-Gouvernementales (FONGS). FONGS is a consortium of nine regional farmers' organizations with 180,000 small farmers as members. Several of the constituent groups of FONGS have been recommended by a number of informants as especially well suited to collaboration with OFSP.

Working with indigenous NGOs will require a new set of skills for OFSP. In some cases, collaborating organizations will not have the administrative or management infrastructure to take full advantage of technical interventions. This will require that OFSP augment its technical assistance with the capacity to provide institution-building as a complement to its technical training.

Peace Corps

The involvement of Peace Corps in the OFSP raises some challenging issues. The first is what priority the OFSP, a small technical assistance project financed by a PVC Matching Grant and privately-raised funds, should accord subsidy to technical backstopping of the Peace Corps. Theoretically, the Peace Corps has other sources of technical support. The Peace Corps easily could absorb all the OFSP's resources.

To date, OFSP's work with the Peace Corps and with PVOs has been very separate, serving two different clienteles between which there appears to be little communication. Project experience has shed little new light on the issue of Peace Corps' and AID's desire to work more closely. At the beneficiary level, of course, NGOs and AFSI Volunteers are interacting with the same farmers in the same villages. In practice, none of the five Peace Corps Volunteers interviewed by the Assessment Team appeared to view NGOs as important cooperating institutions nor did NGOs appear to view the Peace Corps as a potential resource.

It should be pointed out that the Peace Corps programs in both Sénégal and The Gambia are in stages of transition away from the "animation" or "community development" modality to somewhat more structured and focused approaches like AFSI. It is likely that as these transitions mature, OFSP will be one means by which the work of Peace Corps is integrated more successfully with the work of NGOs.

The degree to which greater collaboration between Peace Corps and NGOs is feasible and desirable is not clear from OFSP experience nor are

institutional constraints or previous Peace Corps experience that might inhibit Volunteer placements with NGOs. These issues are outside the purview of the OFSP, though they pose interesting questions AID might wish to pursue within the context of the OFSP or otherwise. Such an inquiry might be a logical use of the expertise of the PVO Center's.

Advisory Councils

The OFSP Advisory Councils in Sénégal and The Gambia are likely to be the single most important output of the OFSP. Certainly, they will be one of the most effective means of encouraging cooperation and collaboration among NGOs. The Advisory Councils in both countries now are operational. (See Appendix I). The Gambia Council, because it involves more NGOs at present, most dramatically demonstrates the potential for Advisory Councils. It also demonstrates that interagency cooperation is very effectively encouraged at the level of senior technicians focussed on substantive issues. OFSP recently sponsored a three-day trip for the Council during which members visited each others' agricultural programs with good results. A second such trip is planned.

The governance of the two Councils has evolved differently as indicated by their draft by-laws (see Appendix J). The Gambia Council is more formal. It is chaired by Solomon Owens of CRS and sees itself functioning much like an executive committee, providing direction to the OFSP. In Sénégal, members opted for a more informal arrangement, convened by the Project Leader and functioning in an advisory role. In practice, it is likely both Councils will function similarly. As the project evolves, it will be important that both Councils are encouraged to guide the direction and focus of the OFSP and define the services it provides.

There remains some disagreement among the collaborating institutions involved in the OFSP about when the Advisory Councils should have been introduced. They were, in fact, created only in February 1989, during the visit of F. Merton Cregger of the PVO Center and Dr. James C. Delouche of MSU.

The US Advisory Council viewed the in-country Councils as important vehicles for planning and engendering a sense of ownership and urged that they be created early in the project. The Project Leader felt, based on his experience when he arrived in-country in September 1987, that the OFSP must demonstrate it could deliver appropriate technical assistance before convening Advisory Councils.

It seems clear that in replications or expansions of the OFSP concept, Advisory Councils should be instituted as early as possible so that they can serve to involve collaborating organizations and as a basic tool in pre-implementation planning. Had this approach been taken in Sénégal and The Gambia with appropriate backing of Winrock, the process might have afforded the very time for planning and building in-country relationships that, in hindsight, it is clear was lacking.

Host Government Relations

OFSP appears to have taken a reasonable position with respect to the governments of its two host countries. This always is a challenging relationship, especially for small projects. Too close a relationship can mean undue interference or too great demands from resource-starved bureaucracies. Too distant a relationship can render project activities, no matter how good, irrelevant in the larger context of development. The ultimate aim of the on-farm process approach is to devise more effective ways of providing appropriate extension services to small farmers. Since it is only governments that will provide such services on the necessary scale, they must not be ignored. It is hoped that OFSP methodologies will provide host governments with useful models of on-farm technology transfer.

The Project Leader has established a valuable relationship with the expatriate Seed Development Officer at the Seed Technology Unit in The Gambia. Through this connection, some Ministry of Agriculture extensionists have attended training sessions. In Sénégal, beyond the official PVO protocol recently signed by Winrock, there has been little direct contact with government departments. However, the new Sénégal Program Coordinator has strong ties to ISRA. This relationship will reinforce linkages and perhaps allow sharing of the OFSP's low tech, on-farm methods. Likewise, OFSP has established a relationship with the seed component of the AID-financed APS in Sénégal which works directly with the GOS.

Matching Grants

The OFSP budget contains an amount of $9000 for each of the five years of the project for so-called Matching Grants to "enhance seed activities of OFSP collaborators" (see Appendix K). The Matching Grants are an extremely important tool, particularly for engendering a sense of ownership among collaborating organizations and providing modest support to engage in "hands-on" activities related to seed and seed storage. Unfortunately, only one such Matching Grant so far has been made. A grant of $2000 was awarded to CRS/The Gambia for cowpea seed multiplication and promotion (see Appendix L). Though increased emphasis on the value of the grants by OFSP staff may yield more interest, particularly among Sénégalese and Gambian NGOs, the matching grant procedures are cumbersome. Yet there are such fundamentally useful tools that changes in guidelines and requirements to make them more accessible should be a high priority.

There are two problems with current procedures. One can be dealt with fairly easily. The other presents a greater challenge. The simpler problem is that Winrock, on the advice of the AID contracts office, has treated these small grants as subgrants just like the subgrant from Winrock to the PVO Center. This requires a grant-making procedure and complexity of proposal out of all proportion to the size of the grants. Larger organizations are not willing to commit the time; smaller organizations that could benefit most do not have the capability to prepare the proposals. Matching Grant procedures should be altered to resemble the flexible, simplified method used by PVC's grantee, PACT, for its Institutional Development Grants (IDG). PACT's IDGs have purposes similar to the OFSP Matching Grants. In the course of simplifying the grant procedures, it would be advisable to change the name to something less easily confused with PVC Matching Grants and more reflective of their real purpose.

The second, and more complex problem is that matching funds for Matching Grants are part of the overall PVC budget. This means the small OFSP grants are governed by AID regulations and must be matched by privately-raised money. This presents an obstacle for US PVO field offices. Privately raised funds are precious and tightly-guarded by PVO headquarters. Most field offices are unable to gain access to extra privately raised funds.

The principle of matching with cash or in-kind is a good one, but the requirement that the funds be from non-US sources is problematic. In some cases, the small amounts involved will make it possible for US PVOs to match the grants with locally-raised funds. A full solution could require rebudgeting and reallocating match in the PVC budget with the possible result that other matching funds would have to be identified. This prospect will not be welcome to Winrock. However, if adjustments are not made, the OFSP Matching Grants are all but unavailable to most US PVOs because of match requirements and to indigenous PVOs because of application procedures.

3. Assess the training and technical assistance activities of the project.

Training and technical assistance has been carried out in several ways by the OFSP. The most obvious are formal training workshops and seminars. Figure 1 details formal training interventions to date. Periodic visits by Winrock, PVO Center and MSU staff also have served a training function. Such visits have included the following:

Date	Visitor	From	Purpose
June 1988	Nancy Blanks Dr. H.F. Robinson	PVO Center	program development, Advisory Councils
June 1988	Valerie Lamont	Winrock	program development, GOS protocol
August 1988	Joseph E. Cortes	MSU	progress assessment to facilitate MSU t.a.
February 1989	James Delouche F. Merton Cregger	MSU PVO Center	facilitate creation of Advisory Councils
April, May 1989	Valerie Lamont	Winrock	follow-up on Advisory Councils
May 1989	Charles Vaughan	MSU	assist with seed production training
October 1989 (scheduled)	Charles Baskin	MSU	extension systems assessment, training
October, November 1989 (scheduled)	Valerie Lamont	Winrock	orient Sénégal Coordinator, NGO follow-up

Other methods by which the OFSP has carried out training and technical assistance include field trials, field days where farmers are shown the results of trials, follow-up visits to trial plots and, now, the interaction of Advisory Councils. Advisory Council meetings are held periodically in both countries. To date there have been approximately 10 farmers' field days attended by 200 farmers.

Figure 1. OFSP Training Interventions

Target Audience	Number	Date	Duration	Subject	Instructor
PC/S-AFSI	12	4/88	6 days	seed production systems	Osborn
Gambia extnists NGOs, FAO, MOA	15	6/88	2 days	seed storage, post hvst strge	Osborn, STU
Gambia extnists NGOs, FAO, MOA	15	8/88	2 days	seed storage, post hvst strge	Osborn, STU
Gambia extnists NGOs, FAO, MOA	15	9/88	2 days	seed storage, post hvst strge	Osborn, STU
PC/S-AFSI	12	9/88	3 days	info processg strategy	Osborn, PC staff
Gambia extnists NGOs, FAO, MOA	15	3/89	2 days	seed storage, post hvst strge	Osborn, STU Gambia
village animateurs/Sénégal	22	4/89	3.5 days	seed production systems	Osborn, PC
FAO extnsts, The Gambia	12	5/89	1 day	seed management	Osborn, C. Vaughn, MSU
Gambia NGOS	15	5/89	2 days	seed production	Osborn, C. Vaughn, MSU
Gambia NGOS	15	5/89	2 days	seed production	Osborn, C. Vaughn, MS
Gambia NGOS	15	5/89	2 days	seed production	Osborn, C. Vaughn, MSU
Gambia NGOS	15	5/89	2 days	seed production	Osborn, C. Vaughn, MSU
FAO extnsts	13	5/89	2 days	seed production	Osborn, C. Vaughn, MSU
PC/S-AFSI	5	7/89	3 days	seed production, storage	Osborn

The assessment team was unable to observe training during the in-country visit since none was scheduled. Formal evaluations by trainees have been attempted with little success so far. Trainees were confused by the evaluation instrument and treated it as a test of their own knowledge rather than a request for their views of the training quality. This is not unusual in situations where trainees are unaccustomed to such evaluations. A revised instrument is expected to produce more useful information.

Informal reactions indicate the training has been useful. Certainly, both Peace Corps/Sénégal and Peace Corps/Washington acknowledge that the OFSP's technical input in design and training for AFSI/Sénégal has been of critical importance. Positive response to field days also is an indicator of the value of training.

Sample syllabi for OFSP training (see Appendix M) demonstrate that training interventions are well planned and objectives thoroughly thought out. Field days, which are a useful training modality for small farmers, Peace Corps and NGO staff are necessary to organize and carry out the events. The Outline for the Field Days in Bignona and Nioro (see Appendix N) indicate thorough attention to insuring that cooperating personnel understand how to carry out their tasks and the objectives of field days. Similarly, the materials prepared jointly by PC/S and OFSP to guide Volunteers in working with local farmers to carry out peanut seed trials are clear, thorough and well thought-out (see Appendix O).

Much of OFSP's training to date appears to have been of the traditional lecture variety and it has been relatively intense. A great deal of information has been packed into a brief space of time. Though efforts have been made to vary the form of training, it would be worthwhile for the project to explore still other approaches, particularly those that are more interactive and involve participants more directly in the learning process. Evaluations of training delivered could serve to provide ideas about where training is weak and what aspects are more valuable.

The project also should explore the possibility of using a variety of presenters for training. This will be facilitated somewhat by addition of the Sénégal Project Coordinator. Other presenters could be drawn from GOS and GOTG departments and from NGOs. This would serve the dual purposes of varying the delivery of OFSP training and reinforcing linkages with other institutions in the two countries.

Linkages between trainees and a wide range of resources are important. Building these relationships and making sure of their long-term accessibility to extensionists and farmers is an essential part of the OFSP training. Exposure to various resources also will help trainees begin to establish contacts to call on when they need specific technical information or assistance.

Strengthening and institutionalizing the training capacity of OFSP collaborators collaborating organizations is necessary to continuing impact resulting from OFSP interventions. Emphasis should continue to be laid on training of trainers, so that NGO extensionists in particular are provided with training skills, and with appropriate training materials, to important information to their village level beneficiaries.

4. Assess the technical component of the project.

The Evaluation Specialist for the Mid-term Assessment was identified for his expertise in institutional relationships among private organizations and for his management experience. He does not have a technical background in agriculture. Therefore the Specialist's general observations about the technical component of the project will be supplemented by a deposition prepared by Dr. James Delouche of Mississippi State University.

Comments of Evaluation Specialist

The OFSP is predicated on the assumption that as much as 90 percent of the seed sown in Africa by small-scale farmers comes from stocks selected and stored by those same farmers. A second assumption is that there are simple ways farmers can improve how they select seed and how they store it, thus increasing the quality and yields of their crops. Some of these simple procedures are traditional and have been forgotten because seed has been subsidized by the governments. In some cases, results from traditional or improved seed varieties can be augmented by improved farming practices. Very often this information does not reach farmers because research institutions lack the will, the means or the skills for effective extension.

The OFSP deserves high marks for the thoughtful and conservative approach it is taking in promotion of improved seeds and practices. New practices and new varieties are not promoted without thorough testing. The emphasis is laid on improving yield from traditional varieties and on "low input" agriculture. This approach is based on the belief that small farmers do not have consistent access to fertilizers and other high inputs and often do not know how to use them effectively. Where experiments are carried out with new or unfamiliar varieties, they are promoted through demonstration plots and field days, where farmers can see, and judge for themselves, whether they are worthwhile. OFSP provides only technical assistance, directly and through NGO extensionists and Peace Corps Volunteers. Inputs are not subsidized. Farmers who participate in trials purchase all the inputs themselves.

An overriding need in Sahelian areas is for varieties which are earlier-maturing. This is necessitated by the downward trend in the duration and amount of rains. In the last year OFSP has carried out three major field trials that addressed this need. Two were with millet and rice varieties. The third experimented with various means of storing peanut seed. The rice trials used three different kinds of rice seed for different kinds of soils.

Seed	Characteristics
ROK5	acid, saline soils, medium maturing rate
SJ684D	semi-dwarf, improved from traditional, short maturing cycle, for saline soils such as mangrove swamps where saline problem arises
DJ12-519	rainfed lowland variety for direct sowing, short maturation rate

The results of the trials were fairly predictable in that varieties performed in various soils as expected. They will provide options for farmers depending on the kinds of soils in which they are grown and can, based on the trials be promoted. It is likely that farmers' levels of awareness about soil types they are farming also was increased by the trials so they can make better seed choice decisions in the future.

The results of trials with millet seed were somewhat different. These trials, in the Nioro Department of Sénégal, carried out with the assistance of Peace Corps showed that without fertilizers, none of the improved varieties outperformed traditional varieties conclusively. Three new varieties were tried, each of which had been developed for higher yield, disease resistance and earlier maturation to compensate for decreased rainfall. The three varieties were IBV8004, GAM and Souyna. On the basis of the trials, none of the new varieties will be recommended at present for promotion.

The purpose of the peanut storage trials was to test several ways of preventing post-harvest loss of seed stores from insect and other damage. Peanuts were stored, usually in plastic bags, using no treatment, a commonly-used insecticide, the neem leaf, sand or ash. The trials also were designed to test whether if seeds were removed from the fields earlier than has been the traditional practice, they would suffer less from rotting and insect damage. The trials were carried out by farmers in cooperation with Peace Corps Volunteers. In addition to plastic bags, traditional mud brick storage boxes were tested. The results of the trials indicated that sand and ash performed as well as the commonly-used insecticide in preserving seeds and better than neem leaf. The traditional box proved effective and the trials established that peanuts removed earlier from the field preserved better than those left longer, which is the traditional practice. (See Appendix P).

Owing to its limited capacity, to date the OFSP has confined its interests to grain peanut seeds. This undoubtedly has been a good allocation of resources. However there appears to be considerable interest in both Sénégal and The Gambia among NGOs and the Peace Corps, in maraîchage, production of vegetables for sale. In the future the OFSP should consider whether this interest warrants a broader focus.

Comments of Seed Expert

In the broad sense, the central task (and goal) of the OFSP project is the transfer of appropriate technologies for improving the selection, saving and utilization of seeds by farmers and farmer groups (e.g., villages). The crucial importance of collaboration and cooperation with and among the PVO/NGOs active in agriculture development in Sénégal and The Gambia for the accomplishment of the task and goal of the OFSP project was recognized in its conception, built into its design, and is accorded great prominence in its implementation. On the non-technical side, the establishment of a network for the transfer of selected technologies is a main mission of the OFSP project. The lessons learned in the OFSP project could be invaluable in marshalling and harnessing the development resources needed in Africa.

Three Phase Process

Since technology transfer encompasses much more than the communication/ demonstration of technologies to clients, a three phase process is followed with the phases concurrent in some aspects and sites and sequential in others. The three phases are:

- Identification and assembly of technologies deemed relevant and appropriate to on-farm seed selecting and saving.
- Assessment and validation of the more promising and appropriate technologies in realistic settings with collaborators and clients.
- Communication/demonstration of validated technologies with assistance to clients in their application.

As emphasized above, the three phases have been (are) implemented concurrently in some cases and sequentially in others.

Identification and Assembly Phase

Both technology needs and potential technologies were identified and reviewed during the initial meetings of the several parties involved in the OFSP: Winrock International, the major party, the Center for PVO/University Collaboration in Development (Joint PVO/University Center), and MSU's Seed Technology Laboratory, under the Joint PVO/University Center. The several parties drew heavily upon their varied and long term experiences in seed production and supply operations in the LDCs. Other resources and experiences were mined, especially by the Winrock project staff. The advice and suggestions of PVO/NGO groups were sought during the first survey visit to Sénégal and The Gambia, and in several meetings and visits after formalization of the OFSP project and selection of its staff.

On the basis of the results of the reviews, discussions and "Brainstorming", the broad technical areas of crop variety maintenance and multiplication, seed storage, and information assembly and compilation were selected for emphasis.

- Selected informational materials were assembled in several handbooks for use as references and training manuals.
- A handbook on seed multiplication and production with emphasis on The Gambia was prepared and published in collaboration with a U.K. technical assistance mission.
- Farm level appropriate technologies for the storage of groundnut seeds were assembled and adapted for testing by the Peace Corps collaborators in Sénégal.
- Technologies for very specific applications ranging from cleaning sesame seeds to maintaining varietal purity in millet were identified and passed on to others for evaluation.

The identification and assembly phase is accelerating with closer collaboration with and among PVO/NGOs. A substantial body of field tested appropriate technologies applicable to on-farm seed selection, saving and utilization throughout Africa can be expected by the end of the project.

It should be noted that the seriousness and competence of the OFSP project in the transfer of appropriate technologies are becoming widely known, so that it is beginning to attract suggestions, advice and assistance of specialists with many years experience in the LDCs - the beginning of an informal technology transfer network.

Assessment and Validation Phase

Special attention is being given to the technical soundness of the assessment/validation of promising technologies. The project leader has collaborated with specialists from Mississippi State University and other institutions and agencies in formulating plans and preparing designs for technology assessment and validation. The major assessment underway is the groundnut storage trial carried out in Sénégal with the Peace Corps collaborators. Other technologies and methodologies are under assessment, especially in The Gambia.

There are no problems related to the technical soundness of technology assessment and validation.

Communication/Demonstration and Application Phase

Many lessons have been learned from experiences in seed program/industry development activities in the LDCs since the mid-1950s. Some of these lessons have been previously validated under conditions similar to those in Sénégal and The Gambia, so there is no need for further assessment of adaptation. They can be directly communicated/demonstrated (transferred) to clients for application.

The main mechanism used for transfer of technologies in the OFSP is training in a variety of settings and styles ranging from informal discussions to the formal short course. Within the OFSP training has the dual objectives of (1) transfer of technology in the form of information, and (2) "teaching" collaborating PVO/NGO personnel about the role and importance of seeds in agricultural production. The latter is especially important in developing a "seeds" understanding and appreciation on the part of managers and supervisors so that they will devote resources to seed production and supply and seek closer ties with others involved in similar activities.

The training in the OFSP has been first class. For the most part, the training has been given by the project leader who is an experienced teacher, very experienced seed specialist-teachers from Mississippi State University, and the UK technical assistance person in The Gambia who also has many years experience in seed related training in several LDCs.

The OFSP clearly recognizes that training in the broad sense encompassing technology transfer will produce the most lasting results in Sénégal and The Gambia and it will continue to be emphasized.

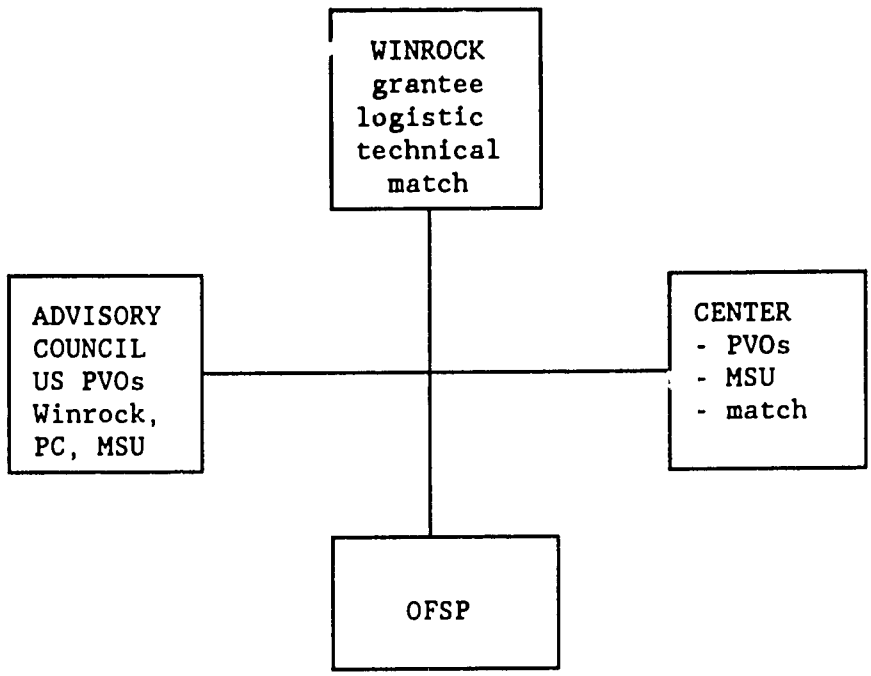
Summary

The OFSP project has a crucial technical dimension. The Winrock staff has substantial expertise and experience in seed technology, and ready access to the considerable resources and experience of Mississippi State University's

Seed Technology group including its assistance, as well as to a growing number of other persons and institutions with relevant experiences interested in the mission of the OFSP project.

5. Assess project administration and logistics.

The administrative structure for the OFSP, with Winrock as the grantee, is a complex arrangement. The structure and responsibilities are as follows:



Communication among the actors is maintained by a US Advisory Council convened by The Center. The multiple arrangement is an innovative attempt to bring a range of needed technical resources to bear on a pressing development problem. All participants should be complimented for their willingness to take the risks involved in a new departure. PVC acknowledged the potential problems that might arise from such a complex administrative structure in the 1987 letter advising Winrock OFSP was being considered for funding. The letter said, "Although we believe that the program you propose involves significant risk because it is so complex and involves so many actors, we believe that the risk factor is more than offset by the potential payoff of designing a successful methodology. This methodology could provide the missing link to the farming systems activities funded by AID over the past several years."

As it turned out, the complexity and lack of clarity about responsibilities of each player contributed to early implementation problems. Partly as a result, from a US-based technical assistance activity, the OFSP has become a full-fledged, field-based program. It is to Winrock's credit that it has not resisted these departures which represent a much larger presence and potentially greater financial and administrative liability than was planned

initially. Winrock has never shrunk from making good on its original commitment to building an on-farm seed capacity in The Gambia and Sénégal.

In discussing the management of the OFSP it should be borne in mind that the scale of the project and its point of entry into the agricultural system both are new for Winrock, as they are for MSU. Making the technical capability of these institutions available at the farm level was the point of the project. As a low tech, small-scale PVO project relying heavily on institutional relationships and incremental, field-based change, the OFSP stands in considerable contrast to much of the work that has gained Winrock its reputation agricultural development. As such, Winrock's involvement has been a learning experience and has required different kinds of responses across the board, including the means by which it provides logistic and administrative support.

That having been said, it seems that Winrock and The Center might have moved somewhat more quickly to address early implementation problems. The Project Leader functioned for some time without the logistic support it was expected would be forthcoming through collaborative arrangements in the field. This, in turn, created considerable waste in human and financial resources. The Project Leader has only recently secured a vehicle, for instance. Previously, he relied on public transportation and occasional trips with Peace Corps/Sénégal staff. The delay was occasioned by the necessity to secure a protocol with the GOS when the anticipated collaboration with cooperating US PVOs did not materialize. Generally, it appears that Winrock, as grantee and the PVO Center took too leadership initiative in resolving early implementation problems.

The OFSP is now lodged comfortably in suburban Dakar in office space rented from the AID-funded Pritech health project. The office has telephone facilities, a computer and effective communication mechanisms via electronic mail, a computer communication network, with Winrock's Washington, D.C. regional office, which provides logistic support and back-up to the program. The facilities are adequate and costs are reasonable.

Lessons of OFSP

Winrock's involvement in the OFSP arises from a 1986 report "Improved Seed Systems For Africa" prepared with partial AID financing. That is to say Winrock's work with the OFSP is an organic expression of an institutional priority. The level of its work in the OFSP is likely to complement much of the other work Winrock undertakes in Africa. Its opportunities in Africa are likely to be on a smaller-scale than it has experienced in the past and to require the skills of collaboration that have been required in the OFSP. In this connection, US staff responsible for supporting the OFSP would benefit from greater familiarity with current thinking on PVO-NGO issues in such fora as InterAction so that the OFSP can be informed by the current "North-South" dialogue and other interventions in the field. Though the Program Manager was conversant with such thinking and issues relevant to PVO development activities, the staff directly involved in the OFSP, including the Program Assistant and the Project Leader, were less so. Institutionally, as Winrock moves into new areas of programming with OFSP and other African initiatives, a full grasp of the issues of changing demands on external organizations will be essential to its effectiveness.

AID Missions

It is a measure of the overall effectiveness of the OFSP that USAID Missions in both host countries are supportive of its implementation and its aims. The relationship of the Project Leader with the staff of the Agriculture Offices of both Missions is positive. Particularly in The Gambia he is seen as a useful and relevant resource.

USAID/The Gambia is especially supportive of the OFSP's and its on-farm, practical approach. The Project Leader often is included in staff meetings on his visits to USAID in Banjul. USAID/Sénégal also is supportive and has suggested a variety of ways the OFSP could benefit from future funding from ongoing projects or those still in the planning stage.

Financial

Winrock administers grant funds from its office in Washington, D.C. Funds for PVO Center services are provided under a subgrant arrangement. Field office funds are administered as a revolving fund and reimbursed monthly on the basis of reports submitted by the project leader. Financial statements are prepared monthly and shared with OFSP personnel.

Despite a different and more costly management structure, there appears to be sufficient money remaining in the existing budget to cover costs for the remaining life of the project. Winrock wisely slowed spending when it became clear that changes were in order so that there would be maximum flexibility when they were implemented. As of 31 August 1989, financial records indicate a total of $540,000 or slightly less than one-third of total budget has been spent, leaving $1,310,000 for the remainder of project through May 1992.

V. RECOMMENDATIONS BASED ON EXPERIENCE AND LESSONS LEARNED

A. Project

- The on-farm, process approach to transfer of agricultural technology is effective. AID, Winrock and other PVOs should explore opportunities for replication and expansion and of refining the methodology;

- On of the most attractive elements of the methodology in the current development climate is that it provides a vehicle for sharing Northern technical expertise without a large field presence or administrative infrastructure. Variations on this approach should be emulated in the design for other PVO projects and in replication or expansion of the OFSP;

- In replications of the on-farm, collaborative methodology, adequate planning time should be allow in implementation plans for building the necessary trust among cooperating organizations;

- In replications of the OFSP, in-country advisory councils should be initiated as early as possible;

- Despite the ultimate decision by the OFSP to base the project in the field, the possibility of a US-based model should be considered in replications;

- OFSP should develop a body of baseline information adequate to enable quantitative measurements of impact on the practices and productivity of its rural farmer target groups;

- an efficient ongoing monitoring system should be put in place by the OFSP to document changes in agricultural yield, changes in agricultural practice, effectiveness of improved practices and other key objectives of the project;

- Production of information and materials production is an important project output for the OFSP and should be a priority use of resources in the final half of the project;

- Sustainability of the OFSP in the context of Sénégal requires strong linkages with indigenous NGOs. Establishing these linkages should be a high priority during the remainder of the project;

- To complement its efforts to assist indigenous NGOs, the OFSP should increase its capability to provide, or facilitate through collaborating organizations, institution-building services to maximize capacity of immature organizations to absorb technical support. The PVO Center could be useful in helping build OFSP ability in this area;

- To advance the dialogue about PC-NGO collaboration and clarify the significance of the the PC in the OFSP's, the US Advisory Committee should attempt to define the appropriate role for the project in providing services to the Peace Corps and to articulate where the PC-NGO relationship is practical and useful;

- The "Matching Grants" for OFSP collaborating organizations should be uncoupled from the overall project match and procedures should be streamlined so they can serve the valuable purpose in the project they were intended to serve;

- OFSP training should emphasize approaches that link trainees with a wide range of sources of technical information, both within Sénégal and elsewhere so the sources of information remain accessible regardless of the existence of OFSP or similar projects;

- Since there appears to be considerable interest in vegetable seeds in various quarters, OFSP should consider in the future whether it can effectively add vegetable seeds to its services;

- The OFSP should take care to build and maintain appropriate relationships with government entities so that the on-farm approach can serve as a model in government extension programs;

- Winrock should make every effort to insure that the US and field-based staff have opportunities to stay abreast of the issues of the North-South NGO dialogue.

B. Logical Framework

In general, the Logical Framework of the OFSP seems well-drawn and accurately to reflect realistic expectations. It highlights areas, as assumptions, where implementation might be hampered. Several relatively minor changes should be considered to reflect two years of project experience.

For instance, the OFSP likely to achieve an improvement in the "nutrition, income and well-being" at least of the small farmers with which it is in direct contact, and probably on an indirect basis, many others in the villages where it is involved. In that light, the allusion in the Program Goal to "increasing the food supply for urban consumers" is gratuitous. There is no way to measure the impact of a project like the OFSP on urban food supply and, in any case, OFSP is not making a distinction in its work on the basis of cash crops and subsistence crops. The reference to the urban food supply should be stricken from the Goal in the interest of accuracy and possibility of achievement.

Parts of the Logical Framework seem to place too strong an emphasis on new seed varieties. Emphasis should more properly be on appropriate seed varieties and their selection and preservation accompanied by improved farming practices. Appropriate varieties may be new or traditional. Evidence from millet and rice trials is that new varieties, in the sense that they have been previously unknown to farmers, is not the real issue. New or improved millet varieties proved no better than traditional varieties

and rice performance depended more on the relationship of seed and soil type than on new varieties, per se. Farming practices that increase yield and procedures for selecting the best seed for planting the following year are as important for promotion as the seed itself in many cases. Further, de-emphasizing "new" varieties also avoids the dangerous implication that there is some hidden agricultural magic, just out of reach of small-scale farmers, that can alter their situations overnight. This is not the case in Africa, at least so far.

The Project Purpose, as stated in the Logical Framework, expresses the concept of "appropriate" seed varieties and practices well, but some Indicators and Assumptions place undue emphasis on new or improved seed varieties. For instance, the end of project indicator "Locally available seeds for new and improved varieties" might better read "Locally available seeds available for low input, maximum yield farming in a range of soil conditions."

Likewise, the Output "viable seed of new and improved varieties" should be changed to reflect the idea of appropriate seed varieties. The Logical Framework places an appropriate emphasis on the pilot nature of the OFSP and the importance of deriving programmatic models with application elsewhere. The Assumptions are particularly well stated. They will serve the planning process in expansion or replication of the OFSP. Those assumptions referring to the necessary condition of collaboration accurately foretold problems encountered because collaborative relationships were not adequately-established initially. In this respect the assumptions can serve as a good checklist of necessary conditions for future on-farm projects.

The Assumption, that "governments will provide necessary production inputs" was faulty since governments in both host countries have stopped providing subsidized inputs and wish to privatize seed supply along with other agricultural supply systems. The absence of subsidies has had a positive effect on the OFSP because it has made its services more necessary and pertinent to the needs of farmers. Obviously therefore, government subsidy of seed need not remain a significant condition for success. In fact, something like the opposite might be true. A minor criterion for new country selection might be the absence of government subsidy, though such a hypothesis would have thought through carefully.

A P P E N D I C E S

VI. APPENDICES

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C CV of Alphonse Faye
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E Documents Reviewed for Assessment
F Tentative In-Country Schedule, OFSP Mid-Term Assessment
G Interview List, OFSP Mid-Term Assessment
H LWR Letter of Inquiry to OFSP
I Membership Lists, OFSP Advisory Councils, Senegal and The Gambia
J Draft By-Laws of OFSP Advisory Councils, Senegal and The Gambia
K OFSP Matching Grant Guidelines
L CRS Matching Grant Proposal
M Sample Syllabi
N Sample Field Day Outline
O Outline for Peanut Storage Trials
P Peanut Storage Trial Results
Q Acronyms

Appendix A.

OFSP ADVISORY COUNCIL
UNITED STATES

Hunter Andrews	Mississippi State University
Nancy Blanks	Joint PVO/University Center
Mert Cregger	Joint PVO/University Center
Dr. James C. Delouche	Mississippi State University
James Noss	LWR, New York
Tom Osborn	OFSP, Dakar
Scott Osborne	CRS, New York
Dr. Ned S. Raun	Winrock, Washington
Rick Record	Peace Corps, Washington
Willet Weeks	Save the Children, Westport

Appendix B.

NAME: Thomas A. Osborn

KEY QUALIFICATIONS:

Mr. Osborn would bring to the position of project manager his knowledge of Africa, project design, and seed production gained from 13 years experience in domestic agribusiness and international agricultural development. As Associate Peace Corps Director for agriculture in Lesotho and Sierra Leone, he improved existing programs through better training and better communication among government officials, Peace Corps personnel and the private voluntary community. He was particularly successful in identifying needs and expanding volunteer involvement into new areas of development work such as cooperatives, national parks, range management, water management, and road construction. Mr. Osborn has 4 years combined experience in the seed industry, including one year as production supervisor, gained with a family firm in Indiana. He is knowledgeable of all phases of seed production, including land preparation, cultivation, irrigation, pest and weed control, harvesting, processing, treatment and marketing.

EDUCATION: M.S., International Agricultural Development, University of California, Davis, 1979
B.A., Business Administration, Southern Methodist University, 1973

EXPERIENCE:

1986 - present Lecturer, California State University at San Luis Obispo. Teaches three graduate-level seminars in the International Agriculture Development program. Courses include the theoretical and conceptual analysis of agricultural development problems; local, regional, national, and international agricultural commodity marketing systems; and agricultural development program planning, design, implementation, and evaluation. Also teaches undergraduate courses in world agriculture trade policy and world agricultural resources.

1983 - 1986 Associate Peace Corps Director, Lesotho. Directed the agriculture and rural development program, which employed 40 Peace Corps Volunteers (PCVs). Developed and maintained programs in agricultural extension, fisheries extension, village water supply construction, credit unions, appropriate technology and forestry. Expanded existing programs and initiated new programs in handicraft cooperatives, national parks, range management, small dam construction, irrigation, and road construction. Worked closely with government officials and international private voluntary organizations to develop and coordinate programs. Initiated new design for pre-service training for PCVs. Designed, planned and implemented various in-service training programs, including workshops on: horticultural production; dam design and construction; and poultry production. Administered the USAID/Peace Corps small projects

assistance fund, establishing all request and approval procedures, project criteria, proposal guidelines and payment systems.

1980 - 1983 Associate Peace Corps Director, Sierra Leone. Directed extension programs in paddy rice production and fisheries. Working with officials of the Sierra Leone government, developed strategy for placement of PCVs, prepared work sites, formulated job descriptions, and planned strategy for phasing Sierra Leoneans into positions held by PCVs. Introduced farming systems approach to the rice extension program. Developed pre-service training program in paddy rice and tropical crop production, extension methodology, cross-cultural orientation and language instruction. Planned and implemented five semi-annual in-service technical workshops. Initiated contact with IITA and IRRI to gain technical information with which to improve program.

1976 - 1977 and Summers, 1965 - 1973 Production Supervisor, Osborn Seed Company, Culver, Indiana. Managed all phases of soybean and wheat seed production, storage, conditioning, and marketing, which included field inspection for genetic purity, monitoring storage for moisture and insects, operation of air screen cleaning mill, seed treatment, quality control, and wholesale and retail of seed. Also responsible for production of 40 acres of cherry pepper seed and 60 acres of cucumber seeds, which included land preparation, transplanting, weed control, irrigation, integrated pest management, and harvesting. Managed payroll, pricing strategy, and customer relations. Developed technical skills in equipment operation and maintenance.

1974 - 1976 Peace Corps Volunteer, Brazil. Serving as an agricultural economist, coordinated production at 15 orphan school farms. Developed and implemented system of farm evaluation and analysis. Designed cost and production feasibility studies for pigs, chickens, dairy cows, rabbits, vegetables, corn, pineapples, and bananas. Developed and implemented vocational training in agriculture, animal husbandry, automechanics, and electrical repair.

1973 - 1974 Assistant Plant Superintendent, American Equity Press, Dallas, Texas. Supervised typesetting, layout, printing, binding, shipping, and personnel in the production of financial documents.

LANGUAGE: Native: English
Others: Portuguese, Spanish

PERSONAL DATA: Date of Birth: 1952
Citizenship: United States
Address: 449 B Hillview, Morro Bay, CA 93442
Telephone: 805/772-3458; 805/546-2275

Appendix C.

CURRICULUM VITAE

Nom : FAYE
Prénom : Alphonse
Sexe : Masculin
Date et Lieu de naissance : en 1948 à Peycouk Sérère (Thiès)
Nationalité : Sénégalaise
Niveau d'études : Université
Diplôme : Ingénieur Agronomie
Spécialité : Génétique et Amélioration des plantes

DEROULEMENT DES ETUDES

Année scolaire	Etablissement	Diplômes
1957 - 1962	Ecole Daniel Brohier	C.E.P.E
1963 - 1966	Collège St. Gabriel	B.E.P.C
1968 - 1970	Collège St. Gabriel	Baccalauréat Série D
1972 - 1976	Université Catholique du Sacré-Coeur Faculté d'agronomie PIACENZA - ITALIE	Dotter in Agraria mention honorable (Ingénieur Agronome

EXPERIENCE PROFESSIONNELLE

1966 - 1967	Enseignant à l'école primaire Catholique de FANDENE, département de Thiès
1070 - 1971	Enseignant au collège privé Catholique du Sacré-Coeur Joal.

- Entrée à l'ISRA le 1er février 1977 par décision d'engagement à l'essai n° 157/DG/ISRA

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- Recrutement à durée indéterminée à l'ISRA, décision n°1711/DG/ISRA du 20-8-88 en qualité d'ingénieur de recherches et adjoint au chef de service.

- Nommé Responsable de programme Amélioration variétale du riz par note de service n° 28/81 du 22 octobre 1981.

- Directeur du Centre de Recherches Agricoles de Djibélor du 21/03/85 au 10-02-87.

- Chef du Centre de Recherches Agricoles de Djibélor du 10-02-87 au 30-3-88. - Membre de Advisoring Committee of International Rice Testing Programme for Africa.

PARTICIPATION A DES SEMINAIRES ATELIERS

- Conférence Internationale sur le riz pluvial.
  Bouaké (C.I) du 4 au 8 octobre 1982

- Rice Germplasm Genetic Conservation Workshop 25 - 26 April 1983
  IR.RI Los Banos, Laguna, Philippines.

- Conférence Internationale sur le riz pluvial.
  JAKARTA, (Indonesia) du 4 au 6 mars 1985.

- Séminaire International C.I.L.S.S. : NIAMEY, du 6 au 13 décembre 1984.

STAGES

- Conservation des ressources génétiques du 26 novembre au 4 décembre 1982 - I.I.T.A (IBADAN).

- Procedures in the conservation and utilisation of Rice germplasm Plant Breeding and International Rice Germplasm Centre I.R.R.I. march 1983 - August 1983 Los-Banos, Laguna, the Philippines a terminal Report (38 pages).

- Séminaire sur la Gestion des Centres de Recherche Agronomique FAO, Douala, Cameroun - 01 au 18 octobre 1985.

- Utilisation du Logiciel M-STAT. Stage organisé par U.S.A.I.D/Sénégal ; I.S.R.A. et MICHIGAN STATE University du 14 au 25 Janvier 1985

PUBLICATIONS

AUTEURS	TITRES
FAYE (Alphonse) Rice breeder ISRA-CRA/Djibélor SENEGAL	Rice germplasm in Senegal. FAO/IBPGR Plant Genetic Ressources Newsletter, 65 : 16 - 17.

RESUME

L'Institut Sénégalais de Recherches Agricoles (ISRA) prend soin depuis 1982 de la collecte, de la conservation et de l'évaluation du matériel végétal des principales cultures du Sénégal. Dans cette optique, une étude de la collection des souches génétiques de riz a été accomplies aussi bien que pour le cas des riz de mangrove que les riz pluviaux. Cette recherche avait 2 objectifs : (a) l'établissement d'une collection des riz traditionnels et de variétés modernes, et (b) l'assemblage d'échantillons de variétés provenant de collections du monde entier soit pour référence, soit pour introduction dans le programme de sélection en tant que géniteur.

FAYE (A.) Rice breeder GNINGUE (M.) Research assistant ISRA-CRA-Djibélor Ziguinchor - SENEGAL	New upland Rice Varieties for Senegal International Rice Research Newsletter 10 (6) (Dec.85). 3.
FAYE (A.) Rice Breeder GNINGUE (M.) Research assistant ISRA-CRA-Djibélor BP 34 Ziguinchor SENEGAL	DJ.12-519, a promising rice cultivar for rainfed, shallow, drought-prone areas in Senegal. International Rice Research Newsletter 10 (6) (Dec.85). 15-16.
FAYE (A.) Rice breeder COLY (J.P.) Research assistant ISRA-CRA-Djibélor BP 34 - Ziguinchor SENEGAl	Evaluation of rice germplasm for some panicle and grain characteristics. International Rice tillering Research Newsletter 10 (6) (Déc.85). 6.
FAYE (A.) ; GNINGUE (M.) and MANE (O.) Institut Sénégalais de Recherches Agricoles (ISRA) Djibélor SENEGAL	Inheritance of tillering ability in three crosses of upland varieties. International Rice Research Newsletter 12(3) (Jun.87). 10-11.

. L'amélioration variétale du riz pluvial et de napre de 1958 à nos jours
A. FAYE et M. TOURE.

Séminaire sur le riz plùvial en Afrique de l'Ouest ADRAO MONROVI du 13 au 15 mai 1981. 20 pp.

. L'amélioration variétale du riz au Sud du Sénégal acquis et perspectives.
A. FAYE et G. DEMAY.

Séminaire sur les recherches rizicoles, Ziguinchor du 28 au 29 mars 1984. C.R.A. Djibélor - 17 pages.

La culture du riz dans le Sahel.

Séminaire Internation C.I.L.SS, NIAMEY, du 6 au 13 décembre 1984. 18 p. A. FAYE.

Appendix D.

SCOPE OF WORK
MID-TERM ASSESSMENT

THE ON-FARM SEED PROJECT FOR SUB-SAHARAN AFRICA

I. ACTIVITY TO BE EVALUATED

The On-Farm Seed Project for Sub-Saharan Africa (OFSP) was designed to identify and promote improved methods of selection, production, storage and distribution of seeds and vegetative planting material by small farmers in two African countries. After the proposal was approved in March, 1987, Senegal and The Gambia were designated as the countries in which to implement the project by Winrock International, USAID, and the collaborating organizations.

The On-Farm Seed Project (OFSP) operates under a Matching Grant (Cooperative Agreement No. OTR-0290-A-00-7203-00) between Winrock International and AID/FVA/PVC. This five-year project began May 15, 1987, and is scheduled for completion by May 14, 1992.

The midterm assessment was originally planned for the end of the third year. However, USAID proposed scheduling the evaluation at an earlier time to examine project implementation issues and to suggest corrective action. A limiting feature is that there will be fewer project results to observe. However, an early assessment can be useful in guiding future activities of the OFSP, given its distinctive design.

II. PURPOSE AND OBJECTIVES OF THE EVALUATION

A. Purpose

The purposes of the evaluation are to 1) study the activities and examine issues of the On-Farm Seed Project from its beginning, 2) assess progress toward achieving project goals, 3) assess the logframe and revise as necessary, and 4) recommend the direction and scope of activities for the remainder of the project. The recommendations arising from the evaluation will guide the project leader and project collaborators in the field in implementation activities through project completion.

B. Objectives

The objectives of the evaluation are to assess the following:

1. the "process" approach of the project as a valid means of implementation and basis for an on-farm seed production model or methodology. This approach involves researching farmers' seed production, selection, processing and storage practices and incorporating farmers' knowledge into specific interventions.

2. **the degree and kind of participation in the field of project collaborators and the development of seed production networks.** A key component of the project is to foster collaboration among PVOs and between PVOs and Peace Corps as a means of stretching limited development resources.

3. **the training and technical assistance activities of the project.** Providing training and technical assistance are two major ways improved seed production methods are being transferred to the farmers.

4. **technical component of the project.** The project is to be evaluated in terms of the accuracy of information being transferred and appropriateness to the situation in each country.

5. **project administration and logistics.** Winrock International, as lead agency of the project will be evaluated on its management of field and home office activities.

III. BACKGROUND

The On-Farm Seed Project is a joint effort by Winrock International, the PVO/University Center for Collaboration in Development (the Center), several Private Voluntary Organizations (PVOs), Peace Corps, and the Seed Technology Lab at Mississippi State University (MSU). The project was designed to combine the strengths of PVOs and Peace Corps in the field with the experience of MSU in seed technology, collaboration by the Center, and leadership and technical inputs by Winrock International.

In the design of the OFSP, Winrock and the Center consulted with MSU, various PVOs including Catholic Relief Services (CRS), Save the Children Federation (SCF), and Lutheran World Relief (LWR), and the Peace Corps. From discussions with these institutions, it became apparent that there is a need for village-level seed programs in sub-Saharan Africa. When the proposal was submitted in October 1986, the two countries had not yet been selected. Subsequent communication with the field staff of USAID, Peace Corps, CRS, SCF, and LWR led to the selection of Senegal and The Gambia.

The effective date of the Cooperative Agreement was May 15, 1987, after which Ned Raun of Winrock and Hunter Andrews of MSU visited Senegal and The Gambia to plan the field implementation. The project leader, Tom Osborn, and program assistant, Valerie Lamont, began work on the project August 1, 1987 and the first US-based Advisory Council meeting was held on August 28, 1987. The project leader made an implementation planning visit to Senegal and The Gambia September 20-November 20 1987. The trip was followed by a series of meetings with collaborators in the US and the design of training programs and materials.

The project leader returned to Africa March 5-September 30, 1988 to begin field implementation which included training in seed and storage

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for the Peace Corps AFSI program in Senegal and initiation of a series of two-day workshops in The Gambia for PVO extension staff. Technical assistance, program planning, field visits, information gathering, technical networking and establishing official status with the governments were activities undertaken by the project leader. During this time he was aided in his efforts by site visits from representatives of the Center (H.F. Robinson, Nancy Blanks) MSU (Joseph Cortes), and Winrock International (Valerie Lamont, Pierre Antoine). Stateside activities by the program assistant included preparing the project newsletter, cataloguing publications for the data base, editing a seed production manual and representing OFSP in the U.S.

Following the project leader's return to the U.S., an advisory council meeting with project collaborators, and the project's first Annual Review with AID were held. From these meetings it was determined that the project needed more support in country, and that the in-country advisory council meetings needed to be started right away. The project leader returned to Senegal in January, 1989 and was followed by Mert Cregger of the Center and Curt Delouche of MSU to help establish in-country advisory councils and to provide technical support.

Meetings were held, and one recommendation was that the project leader be based in Africa, rather than in the US as originally planned. It was also recommended that the project leader have more in-country support in order to fulfill the requirements of the project. Based on another recommendation, the program assistant made a site visit April 14-May 31 1989 to help set up an office in Dakar, and follow up other activities to free the program leader to pursue training and technical assistance activities. Charles Vaughan of MSU visited in May, 1989 to provide technical assistance and training for Gambian PVOs.

Activities in Senegal have since included the establishment of a temporary office in Dakar, planning and implementation of peanut seed storage experiments with Peace Corps Volunteers, planning of millet and rice field trials with Peace Corps, evaluation of the CRS storage project, networking with local PVOs and other related projects and research organizations, establishment of a provisional in-country advisory council with Peace Corps and PVOs, training of Peace Corps Volunteers in the Rural Animation program, and pursuit of a signed "Protocole" or memorandum of understanding with the Government of Senegal which will allow purchase of a project vehicle at duty-free rates.

Recent activities in The Gambia have included completion of two series of two-day workshops training 70 NGO extension agents in seed production and storage practices with assistance from MSU, a two- day seed management workshop with NGO program leaders, working with NGOs to establish an NGO seed committee and planning seed activities with the committee, and establishment of an in-country advisory council with interested NGOs.

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IV. STATEMENT OF WORK

In order to assess the questions raised in Section II. A. (Purpose of Evaluation), the evaluation will review and analyze the items listed in the project logframe. Similarities and differences between the two country programs will be noted. The project will be assessed in terms of the Program Goal, which is to improve the nutrition, income and well-being of small farmers and increase the food supply for urban consumers in the designated countries.

The evaluation report is to provide empirical findings to respond to the following logframe items, conclusions based on the findings, and recommendations based on an assessment of the results of the evaluation activity The report is to provide lessons learned that may emerge from the analysis.

A. The evaluation will assess progress made toward the achievement of the Project Purpose, as stated in the logframe, which is to identify and promote improved methods of selection, production, storage and distribution of seeds and vegetative planting materials by small farmers, and make recommendations toward achieving or modifying the Project Purpose.

B. The evaluation will assess the outputs listed in the project logframe regarding their validity and implementation status at midterm.

   1. How many Peace Corps Volunteers, PVO staff members, local seed specialists and farmers have been trained in improved methods of seed production; what is the amount and level of training they have received; and what are their qualifications to train others?

   2. To what extent has a collaborative seed production network been established involving PVOs, Peace Corps, local farm groups, and host country institutions?

   3. What training and informational materials have been developed for use by the collaborators?

   4. What on-farm seed production model(s) (or methodology) is being developed that could be adopted or adapted in other countries?

   5. What new or improved seed varieties have been disseminated or promoted?

C. The evaluation will assess the inputs listed in the project logframe regarding their current validity and implementation status at midterm:

   1. What inputs are provided by the collaborating organizations (i.e. Winrock, Peace Corps, the PVO/University Center, Mississippi State University, and the PVOs) in the areas of:

data collection and analysis, improved seed practices/systems, training, information development/distribution, and new seed approaches?

2. What inputs does Winrock International provide (includes the matching grant funding from USAID) in the areas of technical/administrative management and assistance, technical staff and materials for training field project leaders, data collection and analysis, and preparation of field manuals and informational materials?

3. What inputs do the Center and participants such as Mississippi State University provide to the project, in the areas of technical assistance personnel, assembly of technical information, organization and conduct of training?

4. What inputs are provided by the PVOs, Peace Corps, and other institutions in terms of field representation, in-country costs related to programmed activities, and travel and per-diem for field representatives in training?

D. The evaluation will assess the assumptions listed in the logframe regarding their validity at midterm.

1. Assumptions for achieving goal targets are:

   a. that development and promotion of on-farm seed production will increase the availability and use of seeds of improved varieties and increase production of food, forage and tree crops.
   b. that local governments will provide necessary production inputs.
   c. that local governments will support (and not impede) private producer initiatives.

2. Assumptions for achieving the project purpose are:

   a. that Peace Corps and PVO staff will be available in sufficient numbers to be trained to implement field phases of the project.
   b. that Peace Corps, PVO, local farmer groups and public and private agencies will collaborate in on-farm seed production networks.
   c. that indigenous farmer/community groups and public and private agencies will continue to support on-farm seed production after external support is withdrawn.
   d. that public and private agencies will continue to provide new varieties and production technology to meet changing needs.

3. Assumptions for achieving outputs:

   a. that farmers will be motivated to participate in and sustain a community-based seed production effort.
   b. that seed production models developed will be useful in several locales with appropriate modifications.
   c. that adapted seed stocks are available from national and/or international sources.

4. Assumptions for providing inputs:

   a. that USAID and Winrock will provide matching grant support for the five-year project period.
   b. that Peace Corps and participating PVOs will provide field personnel for the duration of the project and beyond.
   c. that local field personnel will receive salary and logistical support from their parent institutions.

V. METHODS AND PROCEDURES

A. Evaluation team

The evaluation team will be composed of at least one full time evaluator and Ned Raun, OFSP home office coordinator. Dr. Raun will act as liaison to OFSP staff and facilitate the process of data collection, analysis and feedback. A part time technical consultant may also be added to the team to assess the technical component of the project.

B. Indicators and Methods of Data Collection

The evaluator will respond to the objectives by looking at indicators as measures toward achieving the project goal, and methods of data collection to support the indicators.

Data collection will include review of project documents including trip reports, annual reports, training and informational materials, correspondence, and other documents relevant to the project. The evaluator will meet with personnel from the Winrock Washington DC office, the PVO/University Center, and Mississippi State University. The evaluator will also conduct a field visit to Senegal and The Gambia to observe OFSP activities and to interview collaborators and others involved with the project including representatives from the Peace Corps, PVOs, and other interested institutions.

Objective 1: Assess process approach

Indicators
- origins of technology or innovation being promoted (external, internal);
- field visits by the project leader to collaborators' sites;

- development and modification of seed technology materials used in workshops and training sessions to fit local situations;
- data gathered using informal techniques as opposed to formal techniques (which was originally part of the project design).

Methods of data collection
- review slides of field activities;
- review peanut seed storage experiment documents and field day outlines;
- interview CRS and Peace Corps representatives in Senegal;
- review PC reports on AFSI/OFSP, and reports on OFSP's role in evaluation of CRS grain storage project;
- interview SCF, CRS, FFHC, Action Aid, and FAO representatives in The Gambia;
- review OFSP project proposal to AID.

Objective 2: Assess participation of collaborators and development of a seed production network

Indicators
- existence of in-country advisory councils composed of OFSP collaborators;
- participation of OFSP program leader in collaborators' seed activities;
- involvement in OFSP by Mississippi State University and The PVO/University Center;
- participation of collaborators in joint seed activities;
- interest and involvement of local and international institutions in seed activities;
- use of in-country matching grants.

Methods of data collection
- review documents of advisory council meetings including bylaws;
- review trip reports of Mert Cregger, Nancy Blanks (the Center), and Joseph Cortes (MSU);
- interview Mert Cregger and Nancy Blanks of the Center;
- interview Hunter Andrews, Curt Delouche, and Charles Vaughan (MSU);
- interview representatives of CRS, LWR, Rodale International, CONGAD, FDEA, and Peace Corps in Senegal;
- interview representatives of CRS, SCF, FFHC, AA, and FAO in The Gambia;
- review matching grant proposal(s).

Objective 3: Assess training and technical assistance activities

Indicators
- number of PCVs, PVO managers and extension agents, and farmers involved in training and demonstration activities, and their qualifications to train others;
- number of participants in training and technical assistance activities that use or disseminate information learned from these activities;

- specific training and technical assistance activities initiated by the OFSP, i.e. workshops, field days, long term training, etc.

Methods of data collection
- interview Peace Corps representative in Senegal;
- interview representative of CRS, SCF, AA, FFHC, and FAO in The Gambia;
- review lesson plans, field day outlines, training evaluations, and other supporting training documents.

Objective 4: Assess technical component

Indicators
- appropriateness of methods and content of technical inputs for the participants;
- appropriate level of training and informational materials for participants in their field activities;

Methods of data collection
- review OFSP training materials, including extension manual and other supporting publications including materials provided by MSU;
- interview MSU representatives (by evaluation specialist);
- interview Peter Henderson (ODA) of the Seed Technology Unit in The Gambia;

Objective 5: Assess project administration and logistics

Indicators
- move of base of operations from Washington to Dakar;
- program support in US, Senegal, and The Gambia;
- formal relationship of OFSP to the governments of Senegal and The Gambia;
- relationship of OFSP as a centrally funded project, to USAID in Senegal, The Gambia, and Washington, DC.

Methods of data collection;
- review OFSP project proposal and 1988 annual report;
- review Mert Cregger's and Nancy Blanks' trip reports;
- review annual report, OFSP correspondence;
- interview OFSP project leader, program assistant, and home office coordinator;
- review documentation and correspondence between OFSP and The governments of Senegal and The Gambia;
- interview AID representatives in Senegal, The Gambia, and the US.

C. Schedule

The evaluation will be conducted in three parts:

Part one: Five working days at the Winrock, Washington, DC office, including visits with personnel at The Center, MSU, and AID/FVA/PVC, for briefing, interviews, and review of project documents, including reports and training materials.

Part Two: Fifteen working days including travel to and from Senegal to conduct a project assessment in Senegal and The Gambia. The team will meet with project collaborators from the following organizations: Peace Corps, Catholic Relief Services, Save the Children, Rodale International, CONGAD, Action Aid, FAO, Freedom from Hunger Campaign and other organizations. The team will also observe ongoing activities of the OFSP (i.e. training, field days, Advisory Council Meetings, etc.).

Part Three: Eight working days at Winrock, Washington, DC office to synthesize collected information and draft the report, prepare the Executive Summary and debrief USAID.

The evaluation will begin September 18, 1989 and finish October 18, 1989. The evaluation will take place for a total of 28 working days. The team will work six-day work weeks overseas and five-day work weeks in Washington. The Washington, DC Office of Winrock International will provide office space and support for the report preparation. The report will be prepared in English. The Winrock Washington Office will be responsible for production and French translation of the report.

VI. EVALUATION TEAM COMPOSITION

A. The evaluation team will consist of at least one outside evaluation specialist, the OFSP home office coordinator, and an optional technical seed production specialist. The individual team members should have the following qualifications:

1. Evaluation specialist (team leader) should have at least five-ten years international development experience and familiarity with PVO and Peace Corps development activities. Working knowledge of French language is highly desirable as well as experience in conducting evaluations, training programs, and technical assistance methodology. The team leader should have experience in project management and be able to conduct an organizational analysis, given that the project is involved with many different institutions.

2. Technical/seed production specialist should have technical knowledge of seed production, processing and storage. The seed specialist will review training and technical materials, observe training and assess the technical quality of OFSP programming. Knowledge of French is helpful. As the seed specialist will review only one component of the project, it is possible that the candidate could be hired in country.

3. Home office coordinator for the On-Farm Seed Project, Ned Raun, will provide assistance to the evaluation, both in the US and in Senegal and The Gambia.

VII. REPORTING REQUIREMENTS

A. The evaluation team will prepare a written report that conforms to the Aid Evaluation Handbook, **AID Program Design and Evaluation Methodology Report No. 7**, April, 1987. The AID required format for evaluation reports includes the following:

1. Executive Summary - 2-3 pages, single-spaced using AID Executive Summary format.

2. Body of the report - 30-40 pages, including discussion of the purpose and study questions of the evaluation, project context, team composition and study methods, evidence/findings of the study, conclusions drawn from the findings, and recommendations based on the findings and conclusions.

3. Appendixes - including a copy of the evaluation scope of work, current Logical Framework, list of documents consulted, and individuals and agencies contacted. Other appendixes may be included that discuss study methodology, technical reports and other documents.

B. Submission of Report

1. The evaluation team leader will be responsible for submitting the final revised evaluation report.
2. Winrock International will be responsible for production and translation of the report.
3. Evaluation team will conduct debriefings with AID and counterpart staff.

VIII. FUNDING

Winrock inputs will include the staff time inputs as required by the project leader, the program assistant, the home office coordinator, and secretarial staff.

AID evaluation funds (approximately $18,000) will cover consultant fees, overseas and US travel, overseas and US per diem, and other costs relating to the evaluation (see attachment C).

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Attachment A

EVALUATION MATRIX

Objectives	Indicators	Methods of Data Collection
1. Assess process approach	-origins of technology used -field visits by project leader -development & modification of training materials -data gathered in field	-review slides of field activities -review peanut storage experiment -interview CRS, PC representatives in Senegal -review PC, CRS reports -interview PVOs in The Gambia -review OFSP proposal
2. Assess collaboration/ seed network	-existence of advisory councils -OFSP participation in seed activities of collaborators -MSU & Center involvement -collaborators in joint activities -other institutions' involvement -in-country matching grants	-review bylaws, advisory council documents -review trip reports: Cregger, Blanks, Cortes -interview Cregger, Blanks -interview Andrews, Delouche, Vaughan, MSU -interview PVO/PC reps in Senegal -interview PVO/PC reps in The Gambia -review matching grant proposals
3. Assess training & technical assistance	-number of people trained from PC, PVOs, farmers -number of trainees using info learned from OFSP -number & kind of OFSP training activities	-interview PC representative in Senegal -interview PVO representatives in The Gambia -review lesson plans, outlines, workshop evaluations
4. Assess technical component	-appropriateness & content of technical inputs -appropriate level of materials for participants	-review OFSP training materials -interview MSU reps -interview Peter Henderson, ODA
5. Assess project administration & logistics	-move of project base from Washington to Dakar -program support in US, Senegal & The Gambia -relationship of project to GOS, GOTG -relationship of project to AID DC, Senegal & The Gambia	-review OFSP proposal, annual report -review Cregger, Blanks trip reports -review reports, project correspondence -interview project leader, program assistant, home office coordinator -review correspondence, documents regarding GOS, GOTG -interview AID reps in DC, Dakar, Banjul

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Attachment B

Evaluation Resources

Following are some of the resources the evaluator for the On-Farm Seed Project will need to conduct the evaluation.

Project Reports and Other Documents

Project Proposal and related correspondence, June, 1986-May, 1987
Trip Report, Ned Raun, June 1987
Minutes of first OFSP Advisory Committee Meeting, August 28, 1987
Trip Report, Tom Osborn, December, 1987
Trip Report, Valerie Lamont, July, 1988
Trip Report, Nancy Blanks, H.F. Robinson, July, 1988
Trip Report, Joseph Cortes, August, 1988
OFSP Annual Report, December, 1988
Minutes of the Advisory Council Meeting, MSU, November, 1988
Trip Report, Mert Cregger, Curt Delouche, February, 1989
Advisory Council Bylaws, Minutes of meetings, correspondence, Senegal & The Gambia, Jan.-Sept. 1989
CRS matching grant proposal
Training workshop evaluations
Project-related correspondence

Informational/Training Materials (OFSP Washington, Dakar Offices)

Seed Multiplication Manual for Extension Workers in The Gambian Seed Industry
Seed Program Development (MSU)
Reading Materials for: Pre-Service Training, AFSI, Senegal
The Seed System, Seed and Grain Storage, v. 1 & 2
Slides of OFSP field activities
Project newsletter: Seed Sowers/Les Semeurs
Peanut seed storage experiment
Outline of field days for Peanut seed storage experiment
Lesson plans, outlines for PC training-Senegal, PVO training-The Gambia
Data base/library of documents

Interviews in the US

Mert Cregger, Nancy Blanks, The Center
Hunter Andrews, Curt Delouche, Charles Vaughan, MSU
Ned Raun, Valerie Lamont, Winrock International
Richard Record, OTAPS/Peace Corps, Washington,
Shane MacCarthy, Ted Field, AID/FVA/PVC

Interviews in Senegal

Tom Osborn, OFSP project leader
Samba Fall, Catholic Relief Service
Alan Johnston, AFSI/Peace Corps
Rob Peterson, Rodale International

Thierno Kane, CONGAD
Doral Watts, Phil Jones (formerly OTAPS/PC), AID

Interviews in The Gambia

Lamin Sanneh, Save the Children
Solomon Owens, Glenn Knapp, Catholic Relief Service
Sana Jabang, Action Aid
Representative, Freedom from Hunger Campaign
Representative, Food and Agriculture Organization

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Attachment C

PROPOSED BUDGET
for OFSP Evaluation

Consultant Fees	
Project Evaluator, 26 days @ $270/day	$ 7,020
Technical Evaluator (in-country) 4 days @ $250/day	1,000*
Overseas Travel	
2 Round-trip tickets to Dakar, Senegal ($1433 ea)	2,866
2 Round-trip tickets to Banjul, The Gambia	240
1 Round-trip ticket to Banjul (technical)	120*
US Travel to Washington, DC	
Project evaluator to Washington, DC and return (Connecticut)	150
Representative from Center for PVO/ University Collaboration	400*
Representative from Mississippi State University	400*
Overseas Per Diem	
Dakar, Senegal 2 persons, 7 days ea. @ $145/day	2,030
Senegal/other sites 2 persons, 4 days ea. @ $50/day	400
Senegal/other sites 1 person, 2 days @ $50/day (technical)	100*
Banjul, The Gambia 2 persons, 2 days ea. @ $83/day	332
Banjul, The Gambia 1 person, 1 day @ $83/day (technical)	83*
US Per Diem	
Consultant, 16 days @ $121/day	1,936
MSU representative, 1 day @ $121/day	121
PVO/University rep. 1 day @ $121/day	121
Other costs	
French translation of report	750
Copying, binding of report	250
TOTAL	**$18,319**

The above budget does not include time inputs of Winrock International staff (project leader, program assistant, home office coordinator).

*may be otherwise funded

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LIFE OF PROJECT:
FROM FY '87 - '92
TOTAL U.S. FUNDING $1,703,263
(matching grant)
DATE PREPARED: 10/10/86

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION:	IMPORTANT ASSUMPTIONS
NGRAM OR SECTOR GOAL: To improve the nutrition, income and well-being of small farmers and the food supply for urban consumers in _____ and _____.	MEASURES OF GOAL ACHIEVEMENT: • Measurable increases in planting and production of improved crop varieties in target communities • Measurable increases in income, nutrition and/or quality of life in target communities	• Compare baseline and EOP data on improved varieties grown, seed production volume, and income in target communities • Estimate overall national interest in extending on-farm seed project to other areas of country on basis of inquiries and discussions with key officials	ASSUMPTIONS FOR ACHIEVING GOAL TARGETS: • That development and promotion of on-farm seed production will increase the availability and use of seeds of improved varieties and increase production of food, forage, and tree crops • That local governments will provide necessary production inputs • That local governments will support (and not impede) private producer initiatives
JECT PURPOSE: To identify and promote improved methods of selection, production, storage, and distribution of seeds and vegetative planting materials by small farmers.	END OF PROJECT STATUS: • Locally available seeds for new and improved varieties • Established local seed production/distribution networks • Trained cadre of host country, Peace Corps and PVO seed production specialists • Nucleus of trained farmers in each target community • Tested on-farm seed production, storage and distribution models	• Availability of tested seed production models that are being used by farmers in target communities • Application of seed production models/improved practices in outside communities	ASSUMPTIONS FOR ACHIEVING PURPOSE: • That Peace Corps and PVO staffs will be available in sufficient numbers to be trained to implement field phases of the project • That Peace Corps, PVO, local farmer groups and public and private agencies will collaborate in on-farm seed production networks • That indigenous farmer/community groups will continue to support on-farm seed production after external support is withdrawn • That public and private agencies will continue to provide new varieties and production technology to meet changing needs
UTS: rained PCVs, PVO staffs, local eed specialists and farmers in mproved methods of seed roduction and storage. table seed of new and improved arieties. ollaborative seed production etworks involving PVOs, Peace orps and local farm groups. n-farm seed production models for doption or adaptation in other ountries. field manuals and informational aterials	MAGNITUDE OF OUTPUTS: • Up to ten PCVs and PVO representatives and local field project leaders per country trained or updated each year • Farmers in four to six communities per country receive orientation and periodic training technologies • Seeds and vegetative materials available in target communities • Network established in each country for on-farm seed industry • On-farm seed production models established for each country • One-two seed production manuals and related informational materials completed	• Numbers of PCVs, PVO staffs, other local field project leaders, and farmers trained • Types and numbers of improved varieties accepted in target communities • Presence of operational collaborative seed production network(s) • Field manuals and informational materials disseminated to target communities and other parties • Interest of outside communities, other countries, and donor agencies in extension of on-farm seed project	ASSUMPTIONS FOR ACHIEVING OUTPUTS • That farmers will be activated to participate in and sustain a community-based seed production effort • That seed production models developed will be useful in several locales with appropriate modifications • That adapted seed stocks are available from national and/or international sources
TS: mbined inputs support: -Data collection and analysis -Improved seed practices/systems -Training -Information development/distribution -New seed approaches inrect International (includes atching grant funding from USAID) Technical/administrative management and assistance Technical staff and materials for training field project leaders Data collection and analysis Preparation of field manuals and informational materials int Center/participants Technical assistance personnel Assembly of technical information Organization, conduct of training IVS and Peace Corps Field representatives In-country costs related to programmed activities Travel and per-diem field representatives in training	IMPLEMENTATION TARGET (TYPE & QUANTITY): • Matching grant awarded and project activities begin August, 1987 • Collection of baseline data begins August, 1987 • Assembly of seed production and storage data begins August 1987; continues throughout project • Training course and materials for PCVs, PVO field representatives and local field project leaders are developed in August-November 1987, and in-country training offered January-February, 1988 in each country and at least once annually thereafter • Continuing technical assistance provided to field representatives by Winrock and Joint Center • Seed production field manuals developed in 1988-1989 • Seed production model completed for each country in second semester 1989 • Decision to be made in January, 1990, on possible extension of project to third and fourth countries	• Annual internal evaluations and annual progress reports • Mid-term evaluation and a formal EOP evaluation	ASSUMPTIONS FOR PROVIDING INPUTS: • That USAID and Winrock will provide matching grant support for the five-year project period • That Peace Corps and participating PVOs will provide field personnel for the duration of the project and beyond • That local field personnel will receive salary and logistical support from their parent institutions

Appendix E. Documents Reviewed for Assessment.

REFERENCES

1. Improved Seed System for Africa, Bentley, Griffiths et al., May 1986.

2. "Concept Paper on On-Farm Seed Production in Sub-Sahara Africa," submitted to AID Office of PVC by Winrock International, July 1986.

3. On-Farm Seed Project for Sub-Saharan Africa, proposal to AID Office of Private and Voluntary Cooperation in collaboration with Joint PVO/University Rural Development Center. October 1986.

4. Letter of Transmittal on OFSP from PVC to Winrock, 5 January 1987.

5. "Trip Report, Sénégal and The Gambia," Ned Raun, 9 June 1987.

6. Minutes, Advisory Council Meeting, Arlington, Virginia: 28 August 1987.

7. "Trip Report, Sénégal and The Gambia," Tom Osborn and Valerie Lamont, 10 December 1987.

8. "Report, Site Visit to On-Farm Seed Project," Nancy L. Blanks, June 1988.

9. "Report on AFSI Implementation," Peace Corps/Sénégal, June 1988.

10. "Workshop in Harvest and Post Harvest Methods," OFSP Syllabus for Training, Jenoi, The Gambia 22-23 June 1988.

11. "Trip Report, Sénégal and The Gambia," Valerie Lamont, 31 August 1988.

12. "Report to Joint PVO/Rural Development Center, Winrock International and MSU of the Farm Seed Production Project, Assessment and Recommendations to OFSP field operations in The Gambia and Sénégal," Joseph E. Cortes, consultant, 6 September 1988.

13. Seed Multiplication Manual for Extension Workers in the Gambian Seed Industry, P.A. Henderson, Sapu: October 1988.

14. OFSP Technical Consultation, 1-8 October 1988.

15. "On-Farm Seed Project 1987-88 Annual Report", December 1988.

16. "Minutes of November 10, 1988 meeting of On-Farm Seed Project Advisory Council," Mississippi State, Mississippi, 12 December 1988.

17. "Evaluation of Community and Grain Storage Project, Catholic Relief Services, Sénégal," Moussa Ba, Ibrahima Seydi, Tom Osborn, March 1989.

18. "Report on Visit to the On-Farm Seed Project in Sénégal and The Gambia, F. Merton Cregger, March 1989.

19. Outline for Peanut Seed Experiment Field Days in the Departments of Bignona and Nioro, May 1989.

20. Minutes of Advisory Council Meeting, Sénégal, 7 June 1989.

21. "Pilot Cowpea Seed Multiplication and Promotion," proposal submitted to OFSP by CRS-The Gambia, 16 June 1989.

22. Minutes of the OFSP Advisory Council Meeting (The Gambia), 7 August 1989.

23. "Executive Summary and Session Minutes of the Internal Review of the On-Farm Seed Production Project," 7 September 1989.

24. Agenda and Meeting Announcement, OFSP Advisory Council Meeting, 27 September 1989.

25. Draft By-Laws of the On-Farm Seed Project Advisory Council for the Gambia, 27 September 1989.

26. Draft By-laws of the On-Farm Seed Project Advisory Council for Sénégal, 3 October 1989.

27. Meeting Announcement, Sénégal Advisory Council meeting, 3 October 1989.

28. Results of Peanut Seed Storage Trials, 3 October 1989.

29. Course Outline, OFSP Seed Production Course.

30. Description, AFSI/OFSP Peanut Seed Storage Experiment, 1989.

31. Description of CRS Cowpea Storage Trial Tests.

32. Draft Concept Paper, On-Farm Seed Project.

33. Winrock Correspondence File, Joint Center.

34. Winrock Correspondence File, OFSP Pre-Implementation.

35. Winrock Correspondence File, Peace Corps.

36. Winrock File, Interna. Review.

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Appendix F.

TENTATIVE
OFSP EVALUATION SCHEDULE OF ACTIVITIES
SENEGAL AND THE GAMBIA
SEPT 23-OCT 7

Sept 23, Sat: Arrival at 1130PM and to the Miramar Hotel
tel#21-55-98, 22-20-97

Sept 24, Sun: Lunch at Les Almadies and initial briefing

Sept 25, Mon: 900AM Meeting with Doral Watts ADO USAID
1000AM Change money
300PM Meeting with Alan Johnston PC/AFSI
700PM Dinner at Chez Tom

Sept 26,Tues: 800AM Depart for The Gambia
1200AM Lamin Sannah SCF North Bank
Afternoon Ferry to Banjul
Check in at The Palm Grove tel#28630

Sept 27,Wed: 1000AM OFSP Advisory Council meeting at CRS
Afternoon meetings with CRS,USAID,SCF
Change money

Sept 28,Thurs: Morning meetings with AA,FAO
Afternoon depart for the Casamance
Early evening arrival in Zignichor
Check in at the Hotel Aubert tel#91-13-79
Meeting with Alfonse Faye ISRA rice agromonist

Sept 29,Fri: With Alfonse Faye to Bignona to meet PCV Mark Chenault
and onto Villages of Tendouk and Tibong to view
AFSI/OFSP rice activities

Sept 30 Sat: Depart Zignichor for Banjul
Noon arrivl at the Palm Grove
Afternoon meeting with Peter Henderson,
ODA Seed Advisor

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Oct 1 Sun: Morning departure from Banjul by ferry
Drive to Nioro
Afternoon Meeting with PVC Steve Liesz
Evening check in at Hotel Paris in Kaolack

Oct 2,Mon: Morning departure for Dakar
Midday arrival and check in at the Miramar
Meeting at OFSP HQ

Oct 3,Tues: OFSP Advisory Council meeting at 900AM
Ned to airport at 1030 for 1230 departure
Afternoon meetings

Oct 4,Wed: Follow-up meetings

Oct 5, Thur: To Thies to meet with Rodale
Ned arrives at 530PM

Oct 6, Fri: Wrap up
Evening departure for airport 1200PM
Air Afrique # 49 departs 240AM

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Appendix G.

INTERVIEW LIST

1. Valerie Lamont	Winrock International	Washington
2. Ned Raun	Winrock International	Washington
3. Ted Field	AID Office of PVC	Washington
4. Thomas J. Marchione	AID/FVA/PPM	Washington
5. James C. Delouche	Mississippi State	Washington
6. Richard A. Record	US Peace Corps	Washington
7. Nancy Blanks(tlphn)	PVO Center	Cullowhee
8. Harry Wing	AID/FVA/PVC	Washington
9. Phyllis Dobyns(tlphn)	Save the Children	Westport
10. Tom Osborn	OFSP	Dakar
11. Phil Jones	Agriculture, USAID	Dakar
12. Nancy Asanga	Asst. Res. Rep, UNDP	Dakar
13. Doral Watts	Agriculture, USAID	Dakar
14. Buddy Shanks	Director, USPC	Dakar
15. Allan Johnston	APCD	Dakar
16. Aboubabcry Tall	Director, SCF/The Gambia	Banjul
17. Barang Danjo	CDA, SCF/The Gambia	Lamin
18. Sanko Sawo	SCF Contract Farmer	Lamin
19. Gary Engelberg	Africa Consultants	Banjul
20. John R. Donahue	Director, CRS/The Gambia	Banjul
21. Donald Drga	ADO, USAID/The Gambia	Banjul
22. Solomon Owens	Program Officer, CRS/The Gambia	Banjul
23. Baboucar Mbye	FAO Fertilizer Project	Banjul
24. Samuel Davis	Methodist Mission	Banjul
25. Sana Jabang	Manager, Food Production Support Service, Action Aid	Banjul
26. Thomas Hobgood	evaluator, AID/Wshngtn	Banjul
27. Ole Pedersen	evaluator, FAO/Rome	Banjul
28. N.P.B. Larsen	Chief of Party, FAO Fertilizer Project	Banjul
29. Svend Christiansen	FAO Fertilizer Project	Banjul
30. Mary Mackey	PCV, AFSI	Bignona
31. Alphonse Faye	consultant, ISRA	Ziguinchor
32. Donna Johnson	PCV, AFSI	Tiobon
33. Ambroise Diene	farmer	Tendouck
34. -------- Diene	farmer	Tiobon
35. Mark Chenault	PCV, AFSI	Tendouck
36. P.A. Henderson	Seed Development Officer, STU	Banjul
37. Steve Liesz	PCV Leader, AFSI	Nioro
38. Kim Miller	CRS	Dakar
39. Samba Fall	Director, Food Storage and Training Project, CRS	Dakar
40. Thierno Kane	President, CONGAD	Dakar
41. Paul Miller	Country Representative, CRS	Dakar
42. Rob Peterson	Rodale International	Thies
43. Moussa Badji	Rodale International	Thies
44. Moussa Bâ	consultant, FONGS	Dakar
45. Mark Holt(tlphn)	APDC	Banjul
46. Lillian Baer	Africa Consultants	Dakar
47. Claudio Bragantini	Seed Specialist, APS	Dakar
48. Wayne Nilesestuen	ADO, USAID/S	Dakar
49. Mazide Ndiaye	President, FAVDO Secretary General, RADI	Dakar
50. F. Merton Cregger	PVO Center	Washington

Appendix H.

B.P. 9051, Bamako, République du Mali • Téléphone 22.74.24 • Télex : 2632 • Télétax : 22.22.81.30

LUTHERAN WORLD RELIEF

Bamako, September 8, 1989

Mr. Tom Osborne
Corps de la Paix
B.P. 2534
Dakar, Sénégal

Dear Mr. Osborne,

Lutheran World Relief is currently collaborating with an umbrella group of 26 groups of young farmers in Dogon Country to design a three-year integrated agricultural project. One of the elements of this project is regenerative agriculture: The group has expressed a desire to learn low-input techniques for producing organic fertilizer, green manures, natural garden pesticides, and grain and seed storage. It is because of the latter that I am writing to you.

Rob Peterson of Rodale International told me that you are doing an "On Farm Seed Project" with Winrock International and a NGO liaison center. I would be interested in getting more information on this project and any technical information you might have (particularly in French) on low-input seed-saving and grain storage techniques.

I would be particularly interested to learn whether you offer any training programs in these techniques. We would consider sending two or three representatives of our group to Senegal if such a training were possible, or possibly bringing one of your people here to do a training sur place.

I wish you well in your work in Senegal and look forward to hearing from you in the near future.

Yours sincerely,

David J. Olson

David J. Olson
Country Representative
Lutheran World Relief/Mali

SECOURS MONDIAL LUTHERIEN

Appendix I.

OFSP ADVISORY COUNCIL
THE GAMBIA

Solomon Owens, Chairman	Catholic Relief Services
Tom Osborn	OFSP
Dr. Earl Gritton	GARD
Lamin Sanneh	Save the Children
Omar Badji	Action Aid
Svend Christiansen	FAO Fertilizer Project
Baboucar Mbye	FAO Fertilizer Project
M.O.S. Jammeh	Freedom From Hunger Council
Tom Cozier	Good Seed Mission

OFSP ADVISORY COUNCIL
SÉNÉGAL

Thierno Kane	CONGAD
Allan Johnston	Peace Corps/Sénégal
Soukeyna Bâ	FDEA
Samba Fall	CRS
Tom Osborn	OFSP
Rob Peterson	Rodale International

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DRAFT

BYLAWS OF THE ON-FARM SEED PROJECT (OFSP) ADVISORY COUNCIL FOR SENEGAL

PURPOSE

The purpose of the Advisory Council for the On-Farm Seed Project in Senegal is to provide guidance in policy making and planning for the OFSP in Senegal. In order for the OFSP to provide a viable service to organizations that are involved in improving the qualtity and quality of seed available to small farmers, an active Advisory Council is needed to guide program activities, i.e.

1. Facilitate collaboration and liaison with organizations working with seed in Senegal
2. Identify program opportunities
3. Review and comment on workplans and schedules

ARTICLE I.
Governance

Section 1. Administration and day to day management responsibilities of the council rest with the OFSP Project Leader.

Section 2. The OFSP Project Leader will chair the council meetings

Section 4. The council will meet as necessary and as determined by the council or Project Leader. Notification will be sent to members at least three weeks before a meeting with a proposed agenda.

ARTICLE II.
Membership

Section 1. Members are organizations that have or are planning collaborative activities with the OFSP. Original members are CRS,PC, Rodale LWR and FDEA. New members are approved by a consesus of 2/3 of the members.

Section 2. Any organization may attend the council meeting

Section 3. Membership will be voluntary, with each organization choosing their own representative for no fixed period of service.

Section 6. More than one individual from an organization may attend meetings.

ARTICLE III.
Rules of Procedure

When not otherwise specified by the Bylaws, Robert's Rules of Order as revised will be followed.

ARTICLE IV.
Amendments to the Bylaws

Section 1. Amendments to these bylaws may be proposed by any member at a meeting with action to be taken on the amendments at that meeting or the following meeting, depending on the issues involved.

Section 2. Approval of proposed amendments shall require an consesus of two-thirds of the members of the council.

bylawsen.vjl

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BYLAWS OF THE ON-FARM SEED PROJECT (OFSP)
ADVISORY COUNCIL FOR THE GAMBIA

PURPOSE

The purpose of the Advisory Council for the On-Farm Seed Project (OFSP) in The Gambia is to be the major policy making and planning body for the OFSP in The Gambia. In order for the OFSP to provide a viable service to international and local Non Governmental Organizations (NGOs) and the Peace Corps, an active Advisory Council is needed to guide program activities, i.e.

1. Facilitate collaboration and liaison with the NGO community in The Gambia
2. Develop OFSP program priorities
3. Develop viable workplans and schedules
4. Establish long term support for seed related activities by NGOs and Peace Corps in The Gambia

ARTICLE I.
Governance

Section 1. The council will nominate and elect a chairman to serve for at least a six month period.

Section 2. Administration and day to day management responsibilities rest with the OFSP Project Leader.

Section 3. A quorum of one half the membership will be required to carry out the business of the council.

Section 4. The council will meet as necessary and as determined by the council or Project Leader. Notification will be sent to members at least three weeks before a meeting with a proposed agenda.

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ARTICLE II.
Membership

Section 1. Members are drawn from organizations that are currently or are planning collaborative activities with the OFSP. Original members are CRS, AA, SCF, FAO, FFHC, GARD, and PC. New members are approved by an affirmative vote of 2/3 of the members present at the meeting.

Section 2. Any organization may attend meetings, but only council members have voting rights.

Section 3. Membership will be voluntary, with each organization choosing their own representative for no fixed period of service.

Section 5. More than one individual from an organization may attend meetings, but each organization has only one vote.

ARTICLE III.
Rules of Procedure

When not otherwise specified by the Bylaws, Robert's Rules of Order as revised will be followed.

ARTICLE IV.
Amendments to the Bylaws

Section 1. Amendments to these bylaws may be proposed by any member at a meeting with action to be taken on the amendments at that meeting or the following meeting, depending on the issues involved.

Section 2. Approval of proposed amendments shall require an affirmative vote of two-thirds of the members of the council.

ARTICLE V.
NGO SEED COMMITTEE

The OFSP Advisory Council also serves as the Gambian NGO Seed Committee.

OFSP IN-COUNTRY MATCHING GRANTS FOR THE GAMBIA

I. PURPOSE: to provide modest levels of financial assistance to enhance the seed activities of OFSP collaborators.

II. CRITERIA: for OFSP/PVO in-country matching grants for seed related activities in The Gambia :

A. PVO match must be from funds that are from non-U.S. government sources. They may be cash or in-kind contributions.

B. Grant is provided on a cost-reimbursable or fixed-cost basis.

C. Overall amount available for PVO matching grants is 62,000 Dalasis ($ 9,000) per year for the life of the project.

D. PVO match must be for the time period of the funding.

E. Grants of 3500 Dalasis to 13500 Dalasis will be encouraged so that grants can be spread among PVOs.

III. PROCEDURE FOR SUBMITTAL -the matching grant request from the PVO should include :

A. Background statement on PVO involvement in seed production and storage

B. Rationale or statement of need for a Matching Grant

C. Description of the proposed activity

D. Schedule of the activity

E. Budget and the PVO/OFSP match items

IV. APPROVAL PROCESS

A. Tom Osborn reviews request in-country

B. In-country advisory council reviews and signs off on approved project agreement

C. Matching Grant Agreement signed by PVO and OFSP

V. ACTIVITY CARRIED OUT

A. Activity supervised and monitored by the recipient PVO with oversight by Tom Osborn as necessary.

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VI. COMPLETION OF ACTIVITY REPORT

A. Brief 1-2 page report describing activity provided to Tom Osborn by the PVO which will include;

1. Comparison of actual accomplishments with established goals for the activity
2. Problems encountered
3. Lessons learned

B. Verification of completion by Tom Osborn (i.e. site visit);

VII. DISBURSEMENT

A. Local check issued to PVO by Tom Osborn. Timing of the disbursement(s) will depend on the cash flow needs of the activity.

VIII. PRIORITY will be given to requests that address seed production, processing, harvesting or storage problems at the village or farm level.

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Appendix L.

CATHOLIC RELIEF SERVICES - USCC - THE GAMBIA

PROJECT PROPOSAL

PROJECT TITLE: PILOT COWPEA SEED MULTIPLICATION AND PROMOTION

PROJECT NUMBER:

PROJECT LOCATION: WESTERN AND NORTH BANK DIVISIONS FOR THE GAMBIA.

PROJECT DURATION: ONE CROPPING SEASON

ANTICIPATED STARTING DATE: JULY 198[illegible]
ANTICIPATED COMPLETION DATE: MARCH 199[illegible]

BENEFICIARIES/TARGET GROUPS:

1. EIGHT VILLAGE SGA'S (4 PER DIVISION)
2. AGRICULTURAL TRAINEES AT CHAMEN TRAINING CENTER - MBI
3. OTHER NGO'S AND GO'S WITH COWPEA PROGRAMS
4. (EVENTUALLY) COWPEA FARMERS NATIONWIDE

PROJECT APPLICANT: CRS-THE GAMBIA

TOTAL PROJECT COST: GAD 28.000 (US $4.000)

AMOUNT REQUESTED FROM CRS-RCPF: GAD 14.000 (US $2.000)
AMOUNT REQUESTED AS MATCHING GRANT FROM OFSP: GAD 14.000 (US $2.000)

PROJECT IMPLEMENTERS:

1. CRS-THE GAMBIA (PROJECTS DEPT)
2. EIGHT VILLAGE SGA's
3. STAFF AND TRAINEES OF CHAMEN TRAINING CENTER

SUBMITTED TO DAKAR CLUSTER: JUNE 16TH, 1989
SUBMITTED TO OFSP: JUNE 16TH, 1989

1. INTRODUCTION AND STATEMENT OF PROBLEM

1.1 Cowpea or Black-eyed bean (Vigna unguiculata) is a grain legume crop grown in The Gambia and in most of the semi-arid areas of Africa. Nutritionally, it is a high protein grain crop for human consumption (sometimes referred to as the "Poor man's meat") and produces high quality fodder for livestock feed. Agronomically, it is a soil-enriching plant because of its ability to fix atmospheric Nitrogen, and also serves as a good cover crop on soils that are susceptible to water and wind erosion. Despite its wide acceptance as a food crop, market surveys have indicated that national production is extremely low and that most of the cowpea consumed in the country is imported from neighbouring Senegal and Mali.

The need therefore to promote cowpea in the Gambia had long been overdue and need not be over-emphasized. In June 1987, CRS in line with its commitment to improve the Nutritional and economic status of Gambian Farm families, jointly launched the National Cowpea Promotion Campaign with the Department of Agricultural Services supported by the USAID financed GARD Project.

The objectives of the campaign were to introduce and test four improved cowpea cultivars on selected Farmers fields, to facilitate the resumption and spread of cowpea production and to introduce cowpea recipes in rural areas.

After two years of cowpea promotion in the Gambia with mixed results, seed for new and sometime old participants in the program are still imported from Senegal at very high cost to CRS and GARD. The campaign even had to limit the number of cultivars being promoted to two, MOUGNE and C3-5 because its foreign suppliers could not furnish the other two cultivars (TN 32-36 and TN-88-63). Low yields and poor quality seeds obtained in many of the campaign locations, prevented most of the producers from keeping and marketing seed.

Seeds in sufficient quantities and high quality are in short supply nationwide. Therefore the need to locally produce high quality cowpea seed to support the national effort to promote the production and utilization of the crop cannot be over emphasized.

1.2 Catholic Relief Services (CRS) has been extremely successful in the promotion of sesame as a major field crop over the last eight years. From scratch, the organization conducted adaptive research for high - yielding cultivars, plant population, planting dates and fertilizer requirements. Agronomic research is still on-going but information already obtained were put together to make-up a production technology package for the crop. CRS also identified and trained over 14

Single-Commodity Extension agents, designated these as village Monitors and armed them with the production technology to assist farmers countrywide in the successful and profitable cultivation of sesame.

1.3 Recently, CRS initiated The Sesame Growers Association (SGA) Project to be implemented by both CRS and the existing 16 SGA's throughout the country over a four and one half years - period beginning in June 1988. The project aims to assist and train 16 SGAs in institution building, to enable them manage and coordinate small scale agricultural businesses including sesame production and processing. Village Monitors, however still continue to assist farmers in the successful cultivation of sesame in collaboration with the extension staff of the Department of Agricultural Services.

1.4 CHAMEN Training Center situated on the North Bank Division is an agriculturally biased training institution that annually recruits young rural school leavers (male and female) from a cross section of villages in the Gambia. Recruits receive both theoretical and practical training on improved Farming Techniques for a period of one year. During this period, agricultural recruits cultivate about half a hectare of crops of their choice. They are provided with imputs to facilitate the successful cultivation of their individual crop choices. At the end of their training period, graduates are provided with loans to take up farming as a business in their respective villages of origin with occasional supervisory and monitoring visits by staff of the institute. The training institution is sponsored by The Gambia Government and a Norwegian organization through the Gambia Cooperative Union.

2. APPLICANTS QUALIFICATIONS TO ADDRESS STATED PROBLEMS

2.1 During the National Cowpea Promotion Campaign all CRS Village Monitors and Project Officer were involved in the implementation of the program. The former were directly responsible for supervising selected farmers in the successful cultivation of cowpea and the latter was responsible for the coordination of the program in the Western and North Bank Division.

2.2 The onfarm seed project has been operating in The Gambia and Senegal for nearly two years now, with the main objective of assisting NGOs with seed programs to enable them deliver improved and quality seed to farmers. As part of its activities in The Gambia, the OFSP has completed two short and intensive training sessions for NGOs extension agents. The courses were designed to enable participants to conduct seed extension activities with contract growers. The courses included (a) seed production and (b) seed harvesting, processing and storage activities. All CRS village monitors and the project officer participated in both training courses offered by the OFSP.

2.3 Agriculture tutors at The Chamen Training Centre are qualified agriculturists on assignments from The Gambia Department of Agriculture to the centre.

Farming at the Chamen Training Center has been very successful over the past years, except during "bad" years when adverse natural calamities such as drought, pest and disease epidemics got beyond control. Success of the centre has been attributed to the professional approach taken by the institution, to its facilities in terms of required imputs and farm implements, and to the follow-up activities by staff members.

3. CONTINUITY OF PROJECT AFTER CRS FUNDING ENDS:

CRS - The Gambia with the assistance of the OFSP is only initiating a system whereby cowpea seeds of sufficient quantity and superior quality will be available to cowpea farmers when they need them and at a cost that is comparatively lower than what they now get them for. The 16 SGA's and Trainees at Chamen selected to be the pilot growers are expected to carry-on the enterprise in Year 2 and subsequent years with little assistance from CRS and DAS extension agents already trained in contract seed production. These two major beneficiaries have both the capabilities and potentials for continuing the project based on records of their performances on past activities of a similar nature. Records of the Chamen training Center have shown the institution capable of carrying-out the project which is in line with its objective of training recruits annually in improved and economically viable farming techniques to enable them take up farming as a business. The graduates after they have experienced the profitability of the successful cultivation of cowpea would include cowpea production in their cropping systems back home after graduation.

The SGA's within the selected sixteen villages are currently going through the process of institution building through CRS assistance in training . CRS will gradually hand over the management of small agro-businesses during the 54 months of the SGA project. SGAs have successfully undertaken the distribution and marketing of inorganic fertilizers, an enterprise that is very controversial because of the high failure rate of major entrepreneurs (GCU) in this area. This commodity is a required and viable imput in any crop or seed production enterprise of which cowpea is no exception. Economic analysis on cowpea have proved cowpea production highly profitable even on a farm size of only one quarter of a hectare. Depending on the performance of Farmers' preferred cultivars the SGAs would incorporate cowpea seed multiplication and promotion into their agro-business activities. Furthermore, as the promotion of cowpea by other NGOs/institutions succeed, the need for quality seed would be realized and therefore the demand.

4. PROJECT DESCRIPTION:

4.1 GOALS

The major goal of this cowpea seed multiplication and promotion project is to make available quality cowpea seeds of farmer - preferred improved cultivars to farmers and organization/institutions, interested/involved in the promotion/cultivation of cowpeas mainly in the North Bank and Western Divisions but also to other parts of the country. The project also aims to introduce and make available four improved cowpea cultivars from IITA and Senegal to farmers in the North Bank and Western Divisions and to trainees at the Chamen Training Center. A third goal of the project is to start a local cowpea seed production and marketing enterprise thereby arresting the use of scarce foreign exchange for the importation of cowpea seeds.

4.2 OBJECTIVES AND IMPLEMENTATION PLAN

4.2.1 OBJECTIVE ONE:

To enable eight villages in the North Bank and Western Divisions and trainees at the Chamen Training Center multiply foundation cowpea seeds to registered seeds for sale to cowpea farmers countrywide by the beginning of the 1990/91 cropping season.

4.2.2 OBJECTIVE TWO:

To introduce four cowpea cultivars to farmers in villages affiliated to SGAs in the North Bank and Western Divisions and to Trainees at the Chamen Training Center through field trips to multiplication plots during the 1989/90 cropping season.

4.2.3 OBJECTIVE THREE:

To advise and assist the 1989/90 participating growers on reliable storage of the harvested seed to enable them get a good price for the seed when it is eventually marketed.

4.2.4 OBJECTIVE FOUR:

To help train participating SGA members and their various executive committees on the principles and practices of seed multiplication, processing and marketing, as an enterprise.

4.3 IMPLEMENTATION PLAN:

The sixteen selected Village SGAs and Chamen Training Center will take the lead role in the implementation of the Project. However, since this is the first of this type of undertaking as the above-mentioned, the CRS-Gambia program will play key roles through technical backstopping by senior staff of the Projects Department; through close supervision and extension guidance, during all stages of implementation, by Village monitors; through the joint provision with OFSP of all required physical inputs and the delivery of these in a timely manner; and through the support for training-related activities that will ensure the institutionalization of, and realization of, the goals of the project.

CRS is in the process of identifying villages to be selected to participate in the project. This exercise will be completed by Village monitors posted to the two Divisions by the third week of June.

Site selection with the advice of an agronomist, clearing and land preparation will be carried out by farmers in the selected sixteen villages and by trainees at the Chamen Training Center before mid July. The selected sites will be inspected by the Banjul based project officer by this period. Based on the characteristics of the cultivars, sowing will be carried out by farmers of the selected sixteen villages and agricultural trainees at the Chamen Training center to be supervised by the village monitors and the project officer during the months of July and August cultural practices including weeding, insecticide application etc will be carried-out during the production period by farmers and trainees at the Chamen Training center. Supervision will be the direct responsibility of village monitors tutors at the training center and the project officer. Harvesting depending on the growth duration of the cultivars will be carried-out during the months of September October and November.

Farmers from within the participant and nearly villages will be invited to attend 2 - 3 field days at the multiplication and Promotion plots hosted by the selected villages and trainees at Chamen Training center during the production period of the crop. They will receive instruction on the successful cultivation of cowpea with particular emphasis on seed production. During the final field day just before harvest, attending farmers will observe and asses the cultivars and will be allowed to express their interests in their preferred cultiver and in their desire to participate in the following year's program. Along side the multiplication and promotion of the cultivars, participating farmers in selected villages trainees at the training center will receive on-site training on seed production techniques to be conducted by village monitors in collaboration with tutors at the Chamen center, and facilitated by the CRS project officer.

following drying of produce by the end of November, composite samples will be collected and sent to the Seed Technology Center at Sapu before storage to determine the suitability of the produce for seed. Based on the results of the test, contract growers will be assisted to either sell their produce to their local SGA's and interested buyers immediately after reserving seeds for the following years program which will be independent of CRS in terms of free imputs but will continue to have access to extension service from CRS and/or other extension services or store the produce in sealed containers for sale later in the year when prices will be higher.

Orders have been made for the supply of foundation seed from IITA and Senegal. Upon arrival, samples will be sent to the STU at Sapu for testing before delivery to contract growers and Chamen Training Center by the end of July 1989. Inputs required for implementation of this project will be purchased by CRS in the Gambia and Senegal during the month of July for delivery to growers by the end of July 1987

Throughout the pre-production, production and post production process, the CRS project Officer will assume responsibility for coordination and monitoring of this implementation plan and for reporting to the Projects Supervisor. The on-Farm Seed Project (OFSP) will be involved in the monitoring and training components among other project activities.

4.4 CALANDAR OF ACTIVITIES

ACTIVITIES	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN
1. Contract growers selected	X							
2. Sites selection	X							
3. Clearing of sites		X						
4. Imputs purchased	X	X						
5. seed samples sent to STU	X	X						
6. Imputs delivered to contract growers		X						
7. Land preparation, fertilizer application and sowing		X	X					
8. Weeding and rouging		X	X	X				
9. Insecticides application		X	X	X				
10. Harvesting and Drying					X	X	X	
11. Sample sent to STU							X	
12. Farmers training	X	X	X	X	X	X	X	
13. Field days			X	X	X			
14. Marketing and storage of seed							X	X
15. Reporting				X	X	X	X	X
16. CRS/OFSP Evaluation						X	X	
17. OFSP Advisory Council Tour					X			

5. EVALUATION

Based on the stated objectives and goods. A joint evaluation of the project by CRS and OFSP will be undertaken in November/December, 1989 to asses the success and/or impact of the project on the participants/beneficiaries. The evaluation will also be used to assess the feasibility of such types of projects in the future. It is also planned to include as many as possible project sites in the proposed tour of projects by the newly formed OFSP Advisory Council in The Gambia. Since the promotion of cowpea had been carried-out during the last two years in the project are(Western Division and North Bank Division), Yield data obtained over those two years would be used as a baseline for comparison with those to be obtained from the multiplication and promotion plots. This comparison may help in determining the yield margin influenced by the project.

At the completion of harvesting, after drying and before storage, samples of produce obtained from the multiplication/promotion plots will be sent to the CTB at Sabi to determine the seed quality. These seed if certified would be available for sale to other NGOs and institution interested/involved in the promotion of cowpeas to farmers in their respective areas of operation. Acute seed shortage for successful cowpea production which this project aims to address, is a perennial constraint. This project will so therefore be evaluated for the extent to which seed are made available to such organizations by the SGR.

Farmers responses regarding their interests in participating in the program or in cultivating cowpea in succeeding years would be used as indications of the impact of the promotional activities of the project.

Short comings and unavoidable circumstances such as severe drought and pest and disease out-breaks beyond control would be taken into consideration as they affect the stated objectives of the project.

6. PROPOSED BUDGET

6.1 INPUTS AND FIELD SUPPLIES:

A.	SEED	
	10kgs/site x 17 sites @ D7/kg	= D 1.190
B.	FERTILIZER	
	50gg. compound (8-24-24)/site x 17 sites @ D1.12	= 952
C.	INSECTICIDES (Minimum of 2 Sprayings)	
	Decis @ 1lt/site x 2 sprays x 17 sites @ D60.1t.	= 2.340
	Dimethoate @ 1lt/site x 2 spray x 17 sites @ D45/1t.	= 1.530
D.	SPRAY EQUIPMENT	
	17 ULV sprayers @ D250 each	4.250
	Battery cells - 17 sets of 8 @ D2.50 each	= 340
	Plastic Buckets - 1 per site x 17 sites @ D50 each	= 850
E.	STATIONERY AND SUPPLIES	
	1 Field note book/site x 17 sites @ D50 each	= 850
	34 Ballpoint pens @ D1.50 each	= 51
	34 Pencils @ D1.00 each	34
	2 Reams Zerox Photocopying paper @ D70 each	= 140
	1 Ream typing paper @ D70	70
F.	STORAGE EQUIPMENT	
	5 (20lt) empty drums/site x 17 sites @ D20 each	= 1.700

6.2 MONITORING AND EVALUATION:

A.	PER DIEM AND HOTEL ACCOMODATION	
	1 Project Officer x 2trips/month x 2nights trip x 7months @ D70	= 1.960
	1 Project Supervisor x 1trip/month x 2 " " x " " @ D70	= 840
B.	FUEL (TRANSPORTATION)	
	2 trips/month x 7months @ 80 lits. per roundtrips for 2 officers = 1,120 lts.	
	50% petrol @ D5.45/litre	= 3.052
	50% diesel @ D3.50/litre	= 1.960
C.	JOINT CRS/OFSP Evaluation team's Expenses for fuel and accommodation	= 2.000

6.3 TRAINING

A.	Food and Beverages for farmers attending field days.	
	2 Field days/site x 17 sites x D100 for catering	= 3,400*
B.	HONORARIUM	
	2 Chamen tutors Assisting in the training of Project participants in the NBD @ D100 each	= 200

6.4 OVERHEADS = 721

TOTAL (GAMBIAN DALASIS)	= 28.000**
US DOLLARS EQUIVALENT	= 4,000

** D1 = US $0.143
D7 = US $1

* Amounts will be given as supplemental funding to the local Village OGA hosting th field day participants.

BUDGET SUMMARY

LINE ITEM	PROPOSED EXPENDITURE CODE	AMOUNT (DALASIS)
1. PERSONNEL:	100	
- Allowance:	130	
- Per Diem	131	1,600
- Hotel Accom.	132	1,200
- Misc	133	2,000
2. FUEL:	200	
- Petrol	210	3,052
- Diesel	220	1,960
- Lubricants	230	210
3. PRODUCTION INPUTS:	300	
- Seed	310	1,190
- Fertilizer	320	952
- Insecticides	330	7,870
4. SMALL FIELD EQUIPMENT:	400	
- Sprayers	410	4,200
- Sprayer Batteries	411	340
- Plastic Buckets	420	510
- Airtight Storage Containers	430	1,700
- Field Notebooks	440	850
5. STATIONERY & OFFICE SUPPLIES:	500	
- Stationery:	510	
- Xerox Paper	511	140
- Typing Paper	512	70
- Office Supplies	520	
- Pens	521	51
- Pencils	522	34
6. TRAINING COSTS:	600	
- Food & Beverages	630	3,400
- Honoraria	640	200
7. OVERHEADS:	900	721
TOTALS - LOCAL CURRENCY =		D28,000
US DOLLARS =		4,000

Appendix M.

SEED PRODUCTION COURSE

FOR NGO extension agents
working in The Gambia

PURPOSE:

To improve the technical and extension skills of 70 NGO seed extension staff, so that they may work more effectively with seed contract growers, thereby providing higher quality and quantities of seed for use by small farmers. This workshop is the follow-up course to the Seed Harvesting, Post Harvest Handling and Storage Course.

OBJECTIVES:

The participants will be able to apply the principles of quality seed production with the contract growers in in their areas.

The participants will have an opportunity to discuss their particular views and problems for potential solutions among the other participants and the trainers.

The participants will be able to explain the key extension messages associated with quality seed production and how to convey these messages to the farmers.

METHODOLOGY:

The participants represent extension staff with varying levels of field experience and technical knowledge. Previous trainings have proven to be very interactive with many good questions and participation. Therefore, a format in which questions are posed to the group or to small groups on each one of the topics to be covered and a discussion of the responses will be the basis for recommendations on each topic.

The blackboard and flipchart will be used for recording and compiling information. The seed extension book will provide background information and limited use will be made of handouts. Slides, demonstrations on field demonstrations on field germination tests and a visit to an excellent nearby contract grower will supplement and emphasize major points of the training. A visit to the Seed Technology Unit lab seed storage and seed processing facility will also be done as appropriate.

TOPICS TO BE COVERED:

Preproduction Activities
- Production planning to meet goals
    - average yields, multiplication rates,
    - replacement rates
- Farmer selection
- Field selection and isolation distances
- Seed treatment and preplant germination tests

Production - how to get highest yield per hectare
- Timing of practices
- Planting: methods, rates, proper plates, depth
- Stand establishment
- Fertility management
- Weeding

Quality Control
- Preplant phase, planting phase, and stand establishment
- Roguing: when and how
- Field inspection
- Variety maintenance

Extension
- what are the essential extension messages for quality seed production

Other Activities
- Field visit to Kemo Fatty rice to observe proper production practices, field preparation, planting and transplanting, weed control
- Demonstration of field germination tests and seedling evaluation
- Slides provided by MSU and OFSP

SCHEDULING:

Day one:

8:00 - 10:00	First session: Preproduction
10:00 - 10:30	Break
10:30 - 12:30	Second session: Production
6:00 - 7:30	Field visit

Day two:

8:00 - 10:00	Third session: Production
10:00 - 10:30	Break
10:30 - 12:30	Fourth session: Extension

5/4/89
spcourse.vjl

WORKSHOP
IN
HARVESTING AND POST HARVEST METHODS
FOR SEED IN THE GAMBIA

BY

The Seed Technology Unit Dept of Agriculture
The On Farm Seed Project for the Gambia and Senegal

Jenoi Training Center

June 22, 23 1988

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TRAINING SCHEDULE

June 22

9:00 - 10:00 Role of the Extension Officer in the Seed Industry

10:00 - 11:00 Introduction to the topics of Harvesting and Post Harvest Handling of Seed, Seed Quality

11:00 - 11:15 BREAK

11:15 - 12:00 Selection Methods, Importance of Harvest Date

12:00 - 1:00 Insect Pests, How to determine Harvest Dates

1:00 - 2:00 LUNCH

2:00 - 3:00 Discussion groups

June 23

9:00 - 10:00 Discussion groups Reports and Feedback

10:00 - 11:00 Harvesting, Handling and Drying

11:00 - 11:15 BREAK

11:15 - 12:00 Winnowing, Selection, Sampling

12:00 - 1:00 Seed Storage

1:00 - 2:00 LUNCH

DEPARTURE

THE ROLE OF A GOVERNMENT EXTENSION OFFICER IN THE SEED INDUSTRY (PETER HENDERSON-SEED DEVELOPMENT OFFICER)

1. EFFECTIVE COMMUNICATION WITH CONTRACT SEED MULTIPLICATION FARMERS.

1.1. BRIEFING, KEEPING UP-TO-DATE: It is essential that all officers working in the field with individual farmers contracted to multiply seed and those who will eventually purchase the improved seed are well briefed in all the latest development of Agricultural Seed Technology applicable to their respective extension areas. The lastest developments in Agricultural Research seed and fertiliser technology, woter management and conservation animal management and general land utilisation, and crop husbandry as they are applicable to his area of command. Alos extension officer should have a clear idea of central governments seed priorities and targets for their duty areas. Therefore a system must exist within extension areas of any government agricultural department to implement this, especially between the department dealing with the service of a seed industry and the extension section. It can be done by set periodic newsletters and directives, periodic meetings, so that each extension officer knows exactly the range of his duties also the timing of each area of duty throughout the cropping year.

1.2. TIMING OF EFFORT: It is vital that contract growers and growers of improved seed have time to assimilate, think about, and activate new seed policies and any new agricultural practices well in advance of the proposed date of implementation. This is especially important with seed crops for multiplication crop, establishment, as only a few weeks delay can mean the difference between profit and loss, or a high or low multiplication factor. Under irrigation and continuous seed multiplication systems it is important to ensure adequate crop coverage over the ground at all times. The covering of all seed crops with correct husbandry techniques at the right time will ensure the full seed potential will be produced when multiplied both in vigour, size, colour, and weight.

Seed production should be like any other commercial/factory operation all the parts must be fitted into place at the right time for the finished product (Seed) to flow off the system at the correct time. Two important components of this as far as extension workers are concerned are the field inspections of growing seed crops in contract growers fields and post harvest sampling of seed lots. Together with the rapid marketing and controlled storage of the seed produced. Also the rapid submission of any forms and sample bags to authority for the necessary processing. The authority in turn must ensure that any forms and sample bags are in place at the right time. A two way process.

1.3. VISUAL AIDS: It is most hepful to have visual and demonstration aids to assist extension workers in the field. The type and layout used will depend on the standard of literacy amoungest the contract growers and farmers to be covered, Also the size and format will depend on whether it is a handout to be left behind at each site, or carried from one to the other.

1.4. EXAMPLES OF VISUAL AIDS: - If left behind - illustrated planting calanders for each type of seed crop to be grower, or fertiliser guide with types and amounts, or pest and disease controls chart al vith input amounts, price, and source of supply. Also cost and source of various seeds. The contracts grower/farmer can then plan his cropping program in the light of the resources that he has or apply for additional help well in advance. If carried around - samples of improved seed of various types and varieties, same with pesticides, fetiliser, seed dressing, pictures and slides, small applicators for pest control products. Snall items of farm machinery. Private seactor comparnies will often agree to participate in this exercise.

2. DEVELOPING GOOD RELATIONSHIPS WITH FARMERS:

2.1 MUTUAL TRUST: - The basis of all acceptance of advice and assistance form an extension officer is mutual trust. If an extension offier gives advice and seed that proves to be bad when utilised, it will result in a smaller crop and a lower income, the farmers will not readily accept further advice from that officer or even that source. Word of this failure may also spread in the farming community and other farmers may then be reluctant to accept advice. The extension officer is there to help farmers solve their problems not cause problem.

2.2 PREPARING FOR CHANGES: - It often takes considerable time to build up a mutual and staff continuity and ongoing effort are the basis for achieving concrete and lasting results. Traditional practices that have developed over the years and been handed down within farming communities with proven results, even if they have a low potential, are always difficult to change. A step by stop approch may be necessary for success, eventually leading to radical change without causing and adverse reaction.

2.3 ASSESSING FARMERS'CAPABILITY FOR CHANGE: A good working knowledge of the strengths and weaknesses of character and situation of potential contract growers of seed can be a grant asset to the extension officer; together with a goodunderstanding of his financial and other ressources i.e. land extent, water resources, land capability, rotations followed, animal power and machinery and seed. This assessment will gratly facilitate the application of seasonal loans in cash or kind, which can be used as a level to motivate husbandry inprovement or change based on a supply of good proven seed.

2.4. GIVING CONSISTENT ADVIES: Try to avoid a divergence of advice by aiming for uniformity in extension effort. Avoid the possibility of confusing farmers if you wish them to follow our advice. To this en the field extension officer should always keep a brief but accurate record of visits made and advice given for future reference in a daily work record book.

2.5. ADVICE AT APPROPRIATE LEVEL: ? Try and always give advice at a level appropriate to the particular farmer. It is better to keep explanations as simple as possible, and always be ready to expand into greater detail if this is requested.

2.6 PREFER LOCAL RESULTS: At husbandry level, aim to introduce simple improvement using sound common sense and experience based on proven practices and results to get the best return from costly improved seed. These can be taken from research department plots, government farms, and progressive farmers in the neighbourhood where similar conditions and restraits may apply.

3. KEEPING RECORDS

3.1. WHY KEEP RECORDS: - It is essential for future seed extension planning that human, topographical, and agricultural statistics are collected, so that there is a sound basis for development. To be meaningful, the records must be as accurate as possible. Detailed measurement may be necessary, together with accurate observation, word of month recording is seldon correct. Detailed profroma, well designed, with no duplication, and standard is essential for ease of extension of all data, and to assist in computer programming, if available. This type of information must be continuous from year to year so that trends can be recongnised and interpreted correctly, and the success or otherwise of the seed extension effort monitored and areas for ..... seed input and multiplication identified. Unfortunately agricultural statistical records are often out of date or unreliable at national level.

4. ECONOMICAL USE OF EXTENSION STAFF: -

4.1 EXTENSION OFFICER/FARMER RATIOS: - The Extension Officer should aim for the maximum coverage over specific farm and village areas to ensure adoguate extension spread and avoid dissipation of effort. The farmer ratio should be carefully calculated, taking into consideration the work lead created for each field extion officer. Frequent and ongoing visits should be planned so that progress can be carefully monitored and advice given, if necessary throughout the period from land preparation to sale. It may be better to have a single specialised extension officer to cover one or a specific group of seed crops or activities if the advice is complicated so that the technical assistance is of the highest of standard.

4.2. MEETING PLACES: - The venues for extension coverage should be carefully chosen to suit individual circumstances and maximise efforts.

(a) Market corners where farmers gather in quantity to sell and buy produce, usually on set days during the week, are ideal for the display of visual aids.

(b) Farmers'union, Co-operatives, or Association meetings.

(c) Individual village centres, welfare halls.

(d) Organised farm walks on adjacent or locally situated Government demonstration, research, or seed multiplication farms.

(e) Seed fertiliser etc.

(f) Trials and demonstration plots on farmers own land.

(g) Classrooms in farmer training centers, farm institutes schools.

4.3. EFFICIENCY: - The coverage of contract growers by extension officers must be set to ensure the maximum on the ground effort wit the minimum wastage of travelling time. Random checks by senior staff may be necessary to ascertain that this is the case.

4.4. THE BASE FOR EXTENSION OFFICERS: These must be carefully selected so that coverage is maximised therefore with minimum movement wastage. If farmers are at high densities, travelling by foot or bicycle is ideal. Fields with seed crops can be viewed and travel costs kept to the minimum.

5. USING EXTENSION WORKERS EFFECTIVELY:

5.1. ASSISTANCE FROM FARMERS: - Progressive seed contract growers should be considered as sub agents and demonstators for seed and seed crops. Often advice from these sources going out to neighbouring farmers is more readily accessible and farmers accept advice more easily from other farmers than a government officer. Seed, crop, animal, implement trials by individual farmers on their own lands have an added advantage.

5.2. EXTENSION OFFICERS IN TRAMS: The team approach by extension worker each dealing with specefic aspect, often has a impact than the individual approach and at the same time ensures that no voids are left in all aspects of an overall agricultural development plan. This is especially important in the areas of main inputs and their correct application such as seed. Follow up operations can be carried out on a reduced scale or by one individual of the team.

5.3. COORDINATION: It is most important to have adequate coordination of all extension workers in set farming or development areas to obviate duplication and divergence of effort.

6. THE RIGHT APPROACH:

6.1. MOTIVATION: - Traditional farmers are conservative, but they will respond to good results, such as increased monetary rewards from higher productivity or improved living standards, although the process may be activated by a pump priming operation involving a certain amount of subsidy or free asistance, rural credit etc.

6.2. JOINING IN THE WORKS: - Extension workers should at all times identify themselves with the farmers and their problems and be willing to work alongside the farmer in whatever operation he is engaged in at the time of the visit, for sometime, and so create a example by work effort, eat with them if invited and always try and give advice in the field on the job.

6.3. EXTRA MURAL ACTIVITES: An extension officer can be accepted quickly by the farming community by playing field sports, organising plays, arranging film show, youth clubs, Y.F.C. Dances, Music groups etc, in rural areas.

6.4. EXTENSION COORDINATION: - It is important to know how to coordinate the related aspects of infrastructure in the rural community suck as marketing, communications, schools, and health clinics.

7. POLICY IMPLEMENTATION:-

7.1. CONCLUSION: A field agent should be provided with clear directives as to the policy that have to be established in this area of command especially the seed stream policy. These should be spelt out in the greatest detail, yet be open to a broad measure of interpretation depending on prevailing conditions. issues can be solved quickly. Should policies change e.g. The replacement of seed varieties, types of crop pest and disease control products, fertiliser, husbandy, or past extension advice altered, then adequate, full and plausible reasons must be given so that they can be clearly be passed on and accepted so that the relationship between the extension officer and the individual farmers is not damaged.

Harvesting and Post Harvest Methods for Seed in the Gambia

A. Introduction

- What is the On Farm Seed Project ?

1. Distinction between seed and foodgrains

   a. Food grains - to be consumed or sold

   b. Seed - to produce a good corp the next year
      - demands a higher price than foodgrains

2. Quality of Seed

   A. physical quality - uniform large size seed, no broken or damaged seed
      free from inert material
      free from diseased seed

   B. Genetic quality - seed of all the same variety for uniform vigorous growth and high yields

   C. With high quality seed:
      High germination rate and vigor
      Good stand establishment
      Uniform maturity and easier harvesting
      Higher yields and income

   D. Basis of any seed industry is high quality seed
      1. The genetic and physical quality must be higher than what the farmer can produce

   E. The focus of this course will be on the harvesting and Post Harvest methods that will
      1. maintain high seed quality
      2. Minimize post harvest losses
      3. Maximize yield and income to the farmer

      We will be looking at
      Selection
      Determination of Harvest Date
      Harvesting
      Drying
      Threshing and winnowing
      Seed selection
      Seed storage

Pratices discussed will be for contract growers and farmers saving their own seed.

F. Selection at Harvest for farmers saving their own seed

1. Selection from fields for consumption or sale
2. The selection should be made in the field not afterwards Why?
3. Is the crop self pollinated or cross pollinated
   self pollinated: - Peanuts, rice, cowpeas, sesame
   cross pollinated: - Millet, sorghum, maize
   a. significance in seed production
4. Isolation distances in meters

	Foundation Seed	Registered Seed
Peanuts	20	10
Millet	600	300
Sorghum	600	300
Rice	20	10
Maize	600	300
Cowpeas	200	100
Sesame	600	300

G. Critera for Selection

1. Color and size - a healthy plant will produce healthy seed
2. Proper maturity - the best plants are sometimes late maturing which means the next generation will be late maturing
3. Where in the field are you selecting plants ?
   a. With cross pollinated crops selections should be made from the center of the field
   b. With self pollinated crops you should not select from the edges of the field
4. Avoid diseased plants or off types

H. Selection at Harvest for contract growers

1. Should not be necessary because
   - the field has been rogued by the farmer
   - the field has been inspected by the extention agent
2. Exception will be when a disease develops in the field which should be eliminated to avoid contimination of the healthy seed
   a. As an extension agent it is your responsibility to identify a disease problem before or after harvest with your contract growers.

I. Determination of the Harvest Date

1. Many factors influence when a farmer harvests his crop, labor shortage, other work, the weather.
2. Timing of seed harvest is extremely important for Seed Quality Why?
3. Effects of harvesting seed too early.

4. After seed maturity is reached (physiological maturity)
   the overall seed quality will decrease if it is left in the field why?
   - Exposure to the weather like late rains
   - Exposure to insect infestation
   - Exposure to birds
   - Exposure to disease
   - Possibility of shattering or lodging
5. Insect infestation by primary feeder
   Primary feeders attack whole grain
   A great threat to seed quality and effective storage is insect infestation at harvest
   Caryedon serratus - groundnut bruchid
   Callosobruchus maculatus - cowpea weevil
   Sitotroga cerealella - angoumois grain moth -
   - millet, maize, rice.
   Sitophilus oryzae - rice weevil rice
   Sitophilus Zea maiz - maiz weevil sorghum, maiz

   Caryedon serratus (groundnut weevil)
   Description: Length 4-7 mm reddish brown with dark marks, strong flier
   Life cycle: Lives in legume trees like acacia and storage structures. Attacks peanuts after they are pulled. Female attaches eggs to outside of peanut shell. Larvae hatches and penetrates into peanut. Larvae feed on peanuts and emerge from peanute to pupate in ovoid cocoon outside the seed or pod. 25 day life cycle

   control: Remove peanuts from the field before infestation, shelling at peanuts before storage, use of chemicals, storage sanitation

   Callosobruchus maculetus (cowpea weevil)
   Description: Length 2-3 mm tan with dark spots
   life cycle: Lives in legume trees like acacia and stored cowpeas. Attacks cowpeas as they mature.
   Female attaches eggs to cowpea pods. Larvae hatches and penetrates the pod. Larvae feed on the cowpeas and emerge from cowpea to pupate in a cocoon 20-25 day life cycle
   Control: Harvest cowpeas as they mature. Shell before storage, use of neem, peanut oil, chemicals, Storage sanitation

Sitrotroga cerealella (angoumois grain moth)
Description: Length 5-8 mm, wing span 13-19 mm fringed wings
Life cycle: Lives in stored grain. Attacks seed in the seed as it matures. Female lays 150 eggs on outside of seed. Larvae penetrates the seed and feeds on it and pupate in the seed. Adult emerges and starts laying eggs 2-3 day later. 20-25 day life cycle
Control: Prompt harvest, sanitation around storage area, threshing the seed, neem, chemical control.

Sitophilus oryzae (rice weevil)
Description: Length 2-3 mm four reddish spots on wing covers
Life cycle: Female lays up to 300 eggs. Female bores hole in kernal deposits egg and seals the egg inside. Larvae feeds on seed, pupates within the seed. Adult eats its way out. 20-25 day life cycle
Control: Prompt harvesting, storage sanitation, neem, chemicals

Sitophilus Zea maiz
Description: Length 3-5 mm four distinct red spots on brown wing covers
Life cycle: Same as rice weevil

J. How Should Harvest Dates be determined?

1. Physiological maturity of the seed is the optimum time for harvest
   - is earlier than traditional harvest.
   - Moisture content of the seed is still high; above 20%
   - Therefore special care must be taken in drying to avoid mold problems

2. Guidelines for determining the Moisture content of the seed for Harvest
   a Characteristics of the plant-generally look for the plant to start drying up and plant stature
      - difficult to do by looking at the plant because drought stress can make the plant look mature
   b Characteristics of the Seed
      Seed goes through drying stages
      - Soft seed (dough) - above 25% Moisture
      - Dry - 12% - 25% Moisture
      - Brittle - below 12%

c The moisture content of the seed can be determined by
- Cutting
- Crushing
- Chewing

d The seed crop should be harvested when it is in the dry stage
- The seed is then dried to the brittle stage before storage

e Other Crop Specific information for Moisture % determination and harvesting date

Peanuts	- plant dies back
Millet	-
Sorghum	-
Maize	- Ear droops
Rice	- Panicle hanging down
Sesame	- Harvest when 75% of the seed is dry before it shatters
Cowpeas	- Dry pods

K. Harvesting - using traditional or improved methods harvesting should be done carefully and quickly.
- Be sure to keep different seed varieties separated
- If seed is being selected from foodgrain fields make sure to harvest the seed first and keep it separate from the remaining crop.

I - Guidelines for proper handling after harvest

a. Remove the seed crop from the field immediately
- To avoid insect infestation
- To avoid losses to birds and rodents

b. Allow for airflow through the harvested crop
- Essential for quick drying
- Avoid mold problems

c. If possible get the crop off the ground for improve air circulation and reduced losses to pests

L. Drying: The process of moisture reduction in the seed

Why is it so important ?

1. To prevent deterioration of the seed
- mold
- reduced vigor and germination
- insect infestation

2. Seed Moisture % Content Scale

35 - 60	Germination
18 - 20	Grain heating
14 +	Mold Growth
12 - 14	Ideal for insect activity
8 - 9	Little or no insect activity low respiration rate by seed

3. Since seed should be harvested at seed maturity (eartlier than traditional harvest) more drying will be required
4. Drying Guidelines
   a. Solar drying on mats, cement, tarpaulins, etc must be done so that seed does not get too hot above 40°C so as to damage the seed embryo
      - control drying by thickness of layer stirring frequently
   b. Take care that varieties are not mixed during drying or that the seed is consumed or contaminated by animals or pests
   c. Drying crops need to be checked frequently and turned several times a day to insure uniform drying and to prevent heat build up and mold growth

M. Threshing and Winnowing

Guidelines
Avoid or minimize damage to the seed
Avoid mixing of seed varieties

Threshing before storage

Advantages: Less storage space
Better protected against pests

Disadvantages: Mold problems will develop if crop not thoroughly dry
Requires time and effort
Does not fit with traditional storage methods

N. Sampling of the Seed: to determine seed quality through testing of a representative sample of the seed lot
- When should seed be sampled
1 Why is the sampling technique to obtain a representative sample so critical
   a. Variations in seed fields and lots exists ie fertility, drought stress, seed mixing. These variations must be represented in the sample for accurate analysis of the seed lot
2 Technique for drawing representative samples
   a. In lots of 3 bags or less equal size samples should be drawn from the top, middle and bottom of each bag
   b. In lots of 4 bags to 30 bags draw 3 samples from every third bag (but never sampling less than 3 bags)
   c. In lots of greater than 30 bags draw 3 samples from every fifth bag (with samples from at least 10 bags)
   d. In sampling from bulk lots in heaps draw 10-20 samples from places near the border, middle and bottom of the heap.

3 With each of these techniques
   a. The samples from the lot should be mixed and a sample of the following size should be obtained

Peanuts, Cowpeas, Maize	1000g.
Sorghum	900g.
Rice	400g.
Millet	150g.
Sesame	70g.

   b. Samples should be labled in detail
   c. Cloth bags should be used for the sample or plastic bags if moisture % is to be determined
   d. Normal testing will include purity, noxious weed content, germination, incidence of seed borne diseases.
4 Seed Sampling is the responsibility of the extension agent working with the contract growers.

O. Seed Selection

a. Damaged, diseased or insect infested seed should be removed prior to storage
b. Large seed has higher germination and vigor than smaller seed
   - If possible only large undamaged seed should be saved the remainder should be consumed or sold
c. Example: Peanuts
   1. Peanuts should be shelled and selected before storage
      - To reduce the bulks of the peanuts for storage
      - to remove insects that are inside the Shell
   2. Problems with early shelling
      - The peanut may be damaged or split with the shell removed
      - The labor required to do the shelling during the harvest time of the year

P. Seed Storage

1. Goal: to maintain the quality of the seed for the storage period through minimizing the rate of deterioration
2. Deterioration - can be defined as the loss of germination, vigor, viability
   - can be changed but not stopped
   - varies among and within varietes
     * Discuss storability of our crops
3. Guide lines to minimizing losses during storage
   a. Successful storage begins with how the seed has been handled before storage
      - Minimize insect infestation by timely harvesting
      - Eliminate insect infested seed before storage by Selection

- Seed must be sufficiently dry
  * Reduces the respiration rate and therefore the deterioration rate - Discuss
  * Reduces insect infestation Why?
    Reduces possibility of mold Why?
  * Low relative humidity of the Gambia is good for storage
- Discuss equilibrium moisture content
- Storage Sanitation is essential
  * reduce infestation from old grain or seed
  * clean storage structure completely before storage and keep it clean
  * clean and sun bags
  * Storage sanitation reduces rodent problems
- The Storage Structure should provide protection from
  * moisture
  * insects
  * rodents
  * birds
  * animals (wild and tame)

b. Analysis of storage Structures of the Gambia based on:
   - Air Flow
   - Protection from Pests
   - Cost and durability

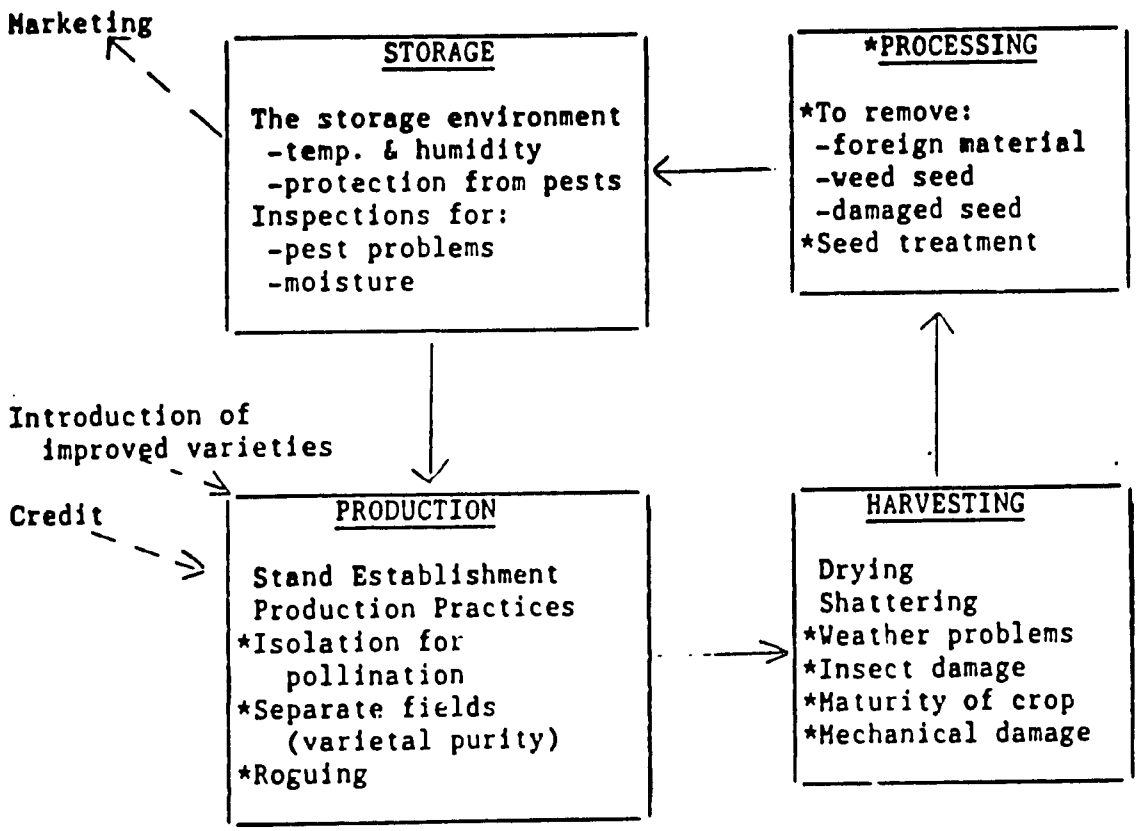
c. Storage Insecticide vs Seed treatment

Equilibrium Moisture Content
at 70% relative humidity
27°C

Equilibrium moisture content is the moisture content (%) of the seed at which ~~the~~ the minimum moisture exchange moisture from the ~~seed~~ air with the seed

THE ON FARM SEED PRODUCTION SYSTEM

The early portion of the project will include gathering data on the seed production system so that an appropriate intervention strategy can be implemented.



*Denotes factors that are significant for seed production but not necessary in production for consumption.

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NOTES ON THE BIOLOGY AND ECOLOGY OF THE GROUNDNUT SEED BEETLE *Caryedon serratus* (OL.) (COLEOPTERA: BRUCHIDAE) UNDER FIELD CONDITIONS IN SENEGAMBIA

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Abstract

Field observations in 1971-1974 that warranted a new approach to control methods for *Caryedon serratus* are reported briefly. Primary host plants were found to provide a continuous series of infestation sources throughout the year for nuts drying or stored in the open, but reinfestation of insect-free stocks in store was shown to be insignificant. The insect commonly emerged from infested nuts as the fourth-instar larva and migrated through bulk-stored nuts and out of bag-stacks before pupating. Adult emergence, mating and egg-laying occurred at considerable depths within a bulk or bag-stack but the fabric of jute bags greatly restricted the movement of adults into and out of the bag. Observations on development periods generally conformed with those reported by other workers.

Résumé

Les observations de terrain réalisées en 1971-1974, ayant nécessité une nouvelle manière d'aborder les méthodes de lutte contre le *Caryedon serratus* sont brièvement indiquées. Il a été remarqué que les principales plantes hôtes fournissent une série permanente de sources d'infestation toute l'année pour les arachides mises à sécher ou entreposées à l'air libre, toutefois, la ré-infestation des stocks exempts d'insectes entreposés dans les magasins est indiquée comme étant insignificative. Les insectes apparaissent fréquemment des arachides infestées en tant que larves du quatrième stade, se dirigent vers les arachides entreposées en vrac et hors des sacs avant de devenir des chrysalides. La maturité, l'accouplement et la ponte des oeufs se produit à des profondeurs importantes dans les produits en vrac ou les sacs, toutefois la structure des sacs en jute permet de restreindre de façon importante le mouvement des adultes dans et hors du sac. Les observations réalisées en ce qui concerne les périodes de développement ont généralement été les mêmes que celles signalées par d'autres chercheurs.

Resumen

Se explican de manera abreviada las observaciones efectuadas sobre el terreno en 1971-1974 que originaron un nuevo enfoque en torno a los métodos de control de *Caryedon serratus*. Las plantas hospedantes primarias demostraron ofrecer una serie continua de fuentes infestantes durante todo el año para las nueces secadas o almacenadas al aire libre, pero la infestación ulterior de las existencias carentes de insectos en el almacén demostró ser insignificante. El insecto normalmente salió de las nueces infestadas como larva de cuarto instar, emigrando a través de las nueces almacenadas a granel y fuera de los sacos apilados antes de crisalidar. La producción de adultos, el apareamiento y la puesta de huevos se produjo a profundidades considerables dentro de un montón o apilado de sacos, pero la tela de yute de los sacos limitó considerablemente el movimiento de los adultos dentro y fuera del saco. Las observaciones sobre los períodos de desarrollo coincidieron generalmente con las recogidas por otros investigadores.

Introduction

From 1971 to 1974 a programme of intensive field work was undertaken under the auspices of the Gambian Department of Agriculture to evaluate existing control measures for *Caryedon serratus* attacking stored, unshelled groundnuts and to develop alternatives where necessary. During this work a number of facts emerged which were at variance with published data on *C. serratus* biology and ecology under field conditions (Conway, 1973, 1974). This new information proved fundamental to a new approach to control. The relevant observations are therefore briefly recorded here.

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Plant hosts and other sources of infestation

Primary hosts. Davey (1958) listed the recorded primary hosts for this species. Appert (1954) cited *Tamarindus indica* (L.) as the principal host species in Senegal. This was confirmed in Northern Nigeria by Prevett (1966), who also listed *Piliostigma thonningi* (Schum.) and *P. reticulatus* (DC). *Caryedon serratus* has also been bred out from a *P. thonningi* fruit pod collected in Uganda (Prevett, 1967).

In order to check this information for The Gambia, fruits from a range of Mimosaceae and Caesalpinaceae were collected, examined and cultured monthly over a complete season. Primary hosts in the savannah flora in order of importance were found to be *P. thonningi, P. reticulatus, T. indica,* and *Cassia sieberiana* (DC). *Prosopis africana* (Guill. & Perr.) was a very minor host. Mature fruits were attacked on the trees throughout the year with infestation at its lowest level during the rains.

Migration of mature larvae from primary host fruits, either on the tree or on the ground beneath, was the sole method of emergence; leaving a characteristic 1 – 1.5 mm hole in the pericarp. In Australia, it is reported that *C. serratus* attacking *T. indica* often pupate on the exterior surface of the fruit pods still on the tree (B R Champ, private communication). In the Gambia, pupation was observed only in the surface 2 cms of leaf litter and soil.

Resting stages. Several workers have commented on the ability of *C. serratus* to survive adverse conditions by entering a resting stage; eg Sohi (1940) in Pakistan, Harada (1940) in Japan and Donahaye *et al* (1966) in Israel. In Senegambia it was shown that a succession of primary host fruiting periods allowed this insect to continue breeding throughout the year, so that there would be no evident advantage for a resting stage. This clearly affects present knowledge on the source of infestation for groundnuts and hence the control measures for this insect. The population appeared to be at a precariously low level on primary hosts towards the end of the rainy season but the potential sites for a resting stage were waterlogged at this time and no resting stages were found.

Source of infestation in groundnuts. Conflicting views have been presented on this topic. In Nigeria, Corby (1941) stated that eggs of *C. serratus* were laid on groundnuts being sundried in the field, whereas Appert (1954) in Senegal and Green (1959) in The Gambia found evidence of infestation in stores and concluded that this constituted the major source of infestation of the new crop. This was a most important conclusion since, in both countries until the 1970's, it formed the basis for control measures aimed at protecting the new crop from cross-infestation in store. However, an extensive pre-season survey of storage premises in The Gambia was conducted over a wide area in 1971 and harvested, drying and stacked groundnuts were sampled in the field at this time. It was established conclusively that residual infestation in storage premises, in this pre-season period, was a rare and insignificant occurrence and that infestation of the drying crop, from primary hosts in the field, was then the only important source of *C. serratus* in stored groundnuts. This finding radically changed the control system to one based on elimination of infestation originating in the field. Reinfestation of an insect-free stock in store was shown to be of no economic significance so that further protective measures were considered unnecessary.

Field infestation of groundnuts lifted early and dried for longer than the usual period in the field, as with confectionery varieties, was shown to be consistently heavier due to their longer period of exposure.

Development of infestation in groundnuts

Bulk storage in the open. Results of laboratory work on *C. serratus* (Davey, 1958), supported by findings from small scale field trials (Green, 1960), had led to the conclusion that emerging adults invariably travelled to the surface of a bulk of nuts where mating and egg-laying took place. The technique of periodic insecticidal dusting of the surface of groundnut *seccos* throughout The Gambia was based on this observation. In the present study it was shown that *C. serratus,* within a bulk of nuts, commonly emerged as fourth instar larvae in the same manner as that described for primary hosts. They then migrated through the bulk in search of suitable pupation sites. Those sites most often chosen were the floor or retaining walls of the *secco.* Nuts in these areas were often matted together with pupal cases and, more significantly, were invariably heavily damaged by further generations of the insect. This suggests that the adults are able to emerge, mate, and lay eggs nearby at a considerable depth within a bulk. Consequently, it shows the probable inadequacy of the usual surface dusting treatments. Placement of samples at various levels in large (1,000 tonne) bulks confirmed this behaviour.

Mating of adult insects at the surface was limited by climatic factors to short periods before and after dusk and dawn. Birds reduced the numbers pupating and mating at the surface. The life cycle of *C. serratus* in large bulks of nuts was found to be complete in 8 to 13 weeks, with peak adult-emergence at 9 to 10 weeks. This agrees with the findings of Appert (1954) and Jonghe D'Ardoye (1935).

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Bag storage in buildings. Groundnuts infested to varying degrees in the field and then bagged and placed in store were shown at the end of the storage period to have damage levels related to the degree of initial infestation. This was without relation to damage levels in other, possibly adjacent bags in a stack or to *C. serratus* activity in the free space of the storage building. Thus, the fabric of a jute bag appears to restrict the movement of adult *C. serratus* to such a degree that damage of up to 100% of the nuts in a bag could take place at any point within a stack without any apparent effect on neighbouring bags.

Flight activity on the surface of stacks and in the free space of stores was almost nil, but large numbers of emerging adults were present on floor areas adjacent to infested stacks. Trapping experiments showed that emergence of fourth instar larvae was a normal occurrence in bag storage. Angles between walls and floor of stores were the commonly chosen pupation sites. The life cycle in bag stores was completed in 8–14 weeks with peak adult emergence at 9–11 weeks.

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Plant Protection Division

'ACTELLIC' DUST

(Contains 2% w/w pirimiphos-methyl)

FOR USE ONLY AS AN INSECTICIDE

An insecticidal dust for control of beetles, weevils, moths and mites in stored maize, wheat, barley, groundnuts and rice. Can also be used for the control of mosquitos, flies and cockroaches.

DIRECTIONS FOR USE

A Stored Products

The use of 'Actellic' Dust should be preceded by thorough cleaning of the grain storage premises and treatment of the building with 'Actellic' 50 EC as recommended on the label.

1 Bagged Grain

For treatment of bagged grain, dust each bag and the completed stock with 'Actellic' Dust using any suitable duster.
Apply 'Actellic' Dust at 1.25 kg per 100m²

2 (a) Admixture with grain

This method is recommended where grain is stored in bulk and where long term protection is required. 'Actellic' Dust may be applied by any means that gives even distribution through the grain mass, e.g. automatic seed treaters or vibratory feeders. Small quantities can be treated in a rotary drum or with mixing devices, e.g. the tuffle.
Admix 'Actellic' 2% Dust at 200—500 g/1000 kg of seed.

(b) "Sandwich" method

Alternatively, the sandwich method can be used by applying a layer of 'Actellic' Dust between each 1 metre of grain as the bin is filled.
Dust the floor and sides of the bin before starting to fill and rake each layer of dust well into the grain. The sandwich method is also suitable for treating grain being filled into bags.
Incorporate or spread 'Actellic' Dust at 200—500 grams per 1000 kg grain.

B Public Health

Refuse tips, dustbins and similar breeding areas of insect pests e.g. mosquitoes, flies, cockroaches etc. Apply 'Actellic' Dust at 35 grams per m².
If used indoors cover all food stuffs before application. Protect food processing equipment and eating utensils from contamination during application.
For detailed local recommendation consult your local ICI company or agent.

PRECAUTIONS

AVOID WORKING IN DUST OR WEAR A MASK.

WASH HANDS AND EXPOSED SKIN before meals and after work.

HARMFUL TO FISH. Do not contaminate ponds, waterways or ditches with chemical or used container.

STORE IN ORIGINAL CONTAINER, tightly closed, in a safe place.

EMPTY CONTAINER THOROUGHLY and dispose of safely.
'ACTELLIC' DUST contains an organo-phosphorus compound.

DO NOT USE if under medical advice NOT to work with such compounds.
If you feel unwell seek medical advice immediately. If possible show the product label to the doctor.

'Actellic' is a trade mark of Imperial Chemical Industries PLC, London.

General Overseas 6500/Th

Countries used in

Ethiopia
Gambia
Ghana
Liberia
Malawi
Nigeria
Sierra Leone
Somali
Tanzania
Zambia

Winrock International
ON-FARM SEED PROJECT
c/o USAID - PMB 19
Banjul The GAMBIA

Dakar, July 6th 1988

Dear

I appreciate your participation and interest in the seed workshop in Jenoi June 22 - 23. It was an opportunity to review principles and pratices of seed harvest and post harvest methods as well as learn from your experience in the field. As you are aware this workshop was the first in a series of workshops that will be offered in order to improve the quality and quantity of seed available to farmers in the Gambia.
I am interested in making the workshop address. The training and technical needs that you have. In order to improve the future workshops I am requesting that you respond to the following questions. I expect your answers to be candid, and as detailed & specific as possible. In this way the evaluation will be useful for me and improve the quality of the workshops for your organisations in the future.

Thank you for your cooperation.

Sincerely.

TOM OSBORN
Project Learder on
Farm Seed Project.

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GROUP DISCUSSION QUESTION #1

INSTRUCTIONS:

The discussion questions are designed to utilize your experience in agricultural extension and seed production to examine some of the problems in The Gambia and your ideas as to potential solutions. It is expected that everyone in the group will contribute to the discussion. It is not expected that everyone should agree concerning problems or answers. Your discussion should be recorded on this sheet so it can be presented to all the groups on Thursday morning for discussion and feedback.

1. The Department of Agriculture has recently focused attention on the problem of low plant populations in groundnuts:

   a) What do you think some of the causes of this problem could be?

   b) How is this problem possibly related to the harvesting and postharvest handling of groundnuts?

GROUP DISCUSSION QUESTION #2

INSTRUCTIONS:

The discussion questions are designed to utilize your experience in agricultural extension and seed production to examine some of the problems in The Gambia and your ideas as to potential solutions. It is expected that everyone in the group will contribute to the discussion. It is not expected that everyone should agree concerning problems or answers. Your discussion should be recorded on this sheet so it can be presented to all the groups on Thursday morning for discussion and feedback.

2. In your experience as an extension worker, what are the factors that prevent farmers from producing better seed? What can be done to overcome these factors?

GROUP DISCUSSION #3

INSTRUCTIONS:

The discussion questions are designed to utilize your experience in agricultural extension and seed production to examine some of the problems in The Gambia and your ideas as to potential solutions. It is expected that everyone in the group will contribute to the discussion. It is not expected that everyone should agree concerning problems or answers. Your discussion should be recorded on this sheet so it can be presented to all the groups on Thursday morning for discussion and feedback.

3. What are the major causes of seed storage problems in The Gambia? What improvements in storage could farmers make that would decrease storage losses and be of little cost to them?

GROUP DISCUSSION QUESTION #4

INSTRUCTIONS:

The discussion questions are designed to utilize your experience in agricultural extension and seed production to examine some of the problems in The Gambia and your ideas as to potential solutions. It is expected that everyone in the group will contribute to the discussion. It is not expected that everyone should agree concerning problems or answers. Your discussion should be recorded on this sheet so it can be presented to all the groups on Thursday morning for discussion and feedback.

4. As a seed contractor, how would you motivate your contract growers to optimize the seed multiplication factor of the seed they are producing and maximize the sale of seed to the contractor's bring in factor?

EVALUATION FOR SEED HARVESTING AND POST HARVEST HANDLING WORKSHOP

I - Comment on the following sections of the workshop
Use the back of the page if necessary

a) - Role of the Extension Officer in the Seed Industry

Was it useful ? Yes .... No....

How could it be improved ?

.....

.....

b) - Field Selection Methods, Pollination, Importance of Harvest Date

Was it useful ? Yes ..... No .....

How could it be improved ?

.....

.....

c) - Storage Insects , How to determine harvest dates

Was it useful ? Yes ..... No .....

How could it be improved?

.....

.....

d) - Discussion Groups, Presentations and Feedback

Was it useful ? Yes ..... No .....

How could it be improved ?

.....

.....

e) - Harvesting, Threshing, Winnowing, Drying, Moisture content

Was it useful ? Yes..... No .....

How could it be improved ?

.....

.....

.../....

f) - Processing, Sampling

Was it useful ? Yes ..... No ....

How could it be improved ?

.....

.....

g) - Seed Storage, Analysis of Storage methods

Was it useful ? Yes .... No ....

How could it be improved ?

.....

.....

2 - What did you find most interesting and useful about the workshop ?

.....

.....

.....

3 - What did you find least interesting and useful about the workshop ?

.....

.....

4 - Are there other issues, problems or topics related to seed that could be addressed :

a) - in future workshop ?

.....

b) - in field visits to you ?

.....

Jenci. Gambia

6/22/89-6/23/89

Training session

Group discussion question #1

In your experience as an extension worker, 1) what are the factors that prevent farmers from producing better seed? 2) What can be done to overcome these factors? 3) How would you advise farmers in your area to improve this aspect of low plant population?

1) Factors preventing farmers from producing better seed:

01. Use of unviable seed.
PH: get farmers to select good seed

02. Lack of proper crop husbandry techniques
PH: how to demonstrate this?

03. Use of infected seed
04. high cost of fertilizer
PH: concentrated manure increases its value.
"women don't use it"

05. Lack of farm implements in order to till the soil before planting instead of sowing on the plot, and draft animal availability and management.
PH: provide farm implements - hire out to neighbors?
Animals in poor condition must be looked after so they can do the work.

06. Lack of the usage of seed dressing chemical
07. Insufficient extension agents to meet the farmers any time required.

2. Advice to farmers (to overcome factors):

01. Use of viable and healthy seeds to produce vigorous plants.
02. Adoption of modern crop husbandry techniques.
03. Avoid the use of poor quality seeds.
04. Reduction in fertilizer prices and easy availability to farm level.
05. Sufficient staff to meet the need of supervision.
06. Availability of implements to ease the problem of tillage.
07. Use of seed dressing chemicals

3. Advice to farmers

01. Following of recommended spacing and timely weeding.
02. Knowing the history of the land
"How can timely weeding improve the number of plants?"
—at time of cultivation
—must have clean fields for certified seed
—must keep on top of weeding

03. Selecting your seeds from the center of the field, e.g. maize, to avoid foreign pollination to occur.
04. Timely harvesting and proper seed storage, i.e. store at the correct moisture content rate.
05. Use of seed dressing chemicals.
PH(?) 2 operations:
preservation - chemical use in storage
dressed with another chemical to protect against seed-borne disease
--SCF doesn't treat because it end us in cooking pot.
PH: use skull & crossbonews or
--give packet of chemical) to farmer only at time of planting

Group Discussion #2: As a seed contractor, how would you A) motivate your contract growers to optimize the seed multiplication factor of the seed they are producing and B) maximize the sale of seed to the contractor's buying in factor?

A. The seed to be multiplied must be of good quality:
high yielding
disease and pest free
pure seed
appropriate moisture content
palatability and accepted (no farmer will accept seed unless it eats well and sells well)

The agronomic practies should be the recommended improved practices and these are:
-recommended seed rate and spacing and dressing
-proper land preparation before planting
-the land should be properly isolated
-the recommended fertilizer rate and type should be followed but timely
-roguing of off types should be carried out at crop emergence, flowering and maturing stages
-weeding should be carried out as recommended and as necessary.
-pest and disease incidence should be monitored and controlled
-harvesting should be timely, then processed and properly dried
-then dressing and storage

PH: timing: each operation must be done in a timelyl way.
How to get farmers to return 50-75% of their seed crops (if they return less than that, we're failing as multipliers)
"give better price & quickly"
"provide farmers with bags for storage"
PH: timeliness is important; pay farmer quickly
PH: trust farmer has with extension agent is important

B. Other
The farmers must be made aware of the need for good seed to maximize their yield.
PH: at the moment, if a farmer plants 1 peanut seed, he gets 4 pods back. He should get 10.
Farmers must be given good seed to build on.

The contract farmers' seed should be then advertised to other farmers to purchase but of course with an increased price.
Farmers can also barter or exchange with other crops, thus reducing the chance of the registered and certified seeds going to the seeds.

Group Discussion #3:

What are the major causes of seed storage problems in The Gambia? What improvements in storage could farmers make that would decrease storage losses and be of little cost to them.

Seed storage problems:
1. Pest and disease infestations at field level due to poor field sanitation and lack of the ideal field processing facilities.
2. Seeds are left lying in the field far along time after harvest and seeds are hence contaminated. This is because growers don't have clean, empty sacks and seed dressing chemicals at the right time.
3. Our stores are such that the construction does not suit storing. The ventilation is not enough at at the moment all our stores need repaires for better storing. Store sanitation is poor.
4. Untimely storage ofs eeds and the wrong use of the right chemical for the right seed and time and dosage.
5. Improper store fumigation (phostoxin) by storage.
6. Once seeds are stored, the stores and left locked and never inspected until the opening of the stores again, which may be 3-4 months later. Any development on pest infestation may not be detected for early control.
7. Unavailability of seed seed dressing chemicals for seed treatment.
8. Poor seeds will never produce good seeds and hence increase susceptibility to infestation.

Suggested Solutions:

1. Good quality seed should be sown in view to physical maturity, genetic purity and plant vigor.
2. All seeds should be dressed before planting to combat soilborne diseases.
3. Field should be weed free, including field perimeters to avoid harbouring of pests in the near vicinity.
4. Seeds should be properly selected when it attains physiological maturity. It should then be transported, dressed and stored safely for the next season after it is given further drying for the required moisture content.
5. There should be periodic inspection of stored seed to check on any development or seed infestation (2-4 weeks). All inputs be available in the right quantity and the right time.
6. Above all, there should be adequate incentives for all extension workers involved to make them efficient on their duties as change agents:

a. training of extension workers to provide more efficient extension workers.
b. mobility of extension workers.
c. visits to compare programs, etc.
d. better payments

PH(?) How can farmers physically preserve their seed? How best to advise farmers:

* many local methods:
ex.
--seed in 200litre drums; save 4 mo.
--neem trees pound leaves & mix powder with seed
--raised platforms with protection of legs
--bins with bamboo sticks; palastered with mortar or cow dung

--calabashes
--brick bin inside house
--farmers store it above cooking fire

PH: as extension workers, try to identify best methods farmers can use that won't cost lots of money. Try to identify farmers with best storage.

Notes of Seed Technology Unit Training
Jenoi, June 23, 1988
Valerie Lamont

Following include comments by Tom Osborn (TAO), Peter Henderson (PH), and the Trainees (T) during the training.

TAO: J. How are harvest dates to be determined?

T: --look at time, number of days from maturity
--appearance of plant (drooping panicle, tassels bent down, groundnut leaves drop)

PH: Plant all seeds at same depth to get same germination rates; crop to ripen at same time.
Look at the seed.

T: Sesame - shake the plant; susceptible to shattering (seed falls to ground in field). Leaves start to turn yellow.

T: Any appropriate technology methods to determine drying for storage? at the field level?

TAO: Back to drying stage; seed crop vs. food crop. Food can dry in the field; can dry to brittle stage for safe storage. Rice at the dry stage is white.

PH: Need a little hand moisture meter. NGOs should provide one to each of their extension staff. This would verify the level of dryness.

TAO: K. Harvest of Seed
L. Drying the seed (more important for seed than for food crops)

T: Considering hazards, what is the best moisture level to store; and to store for how long?

PH: Depends on crop type; each must be handled in a different way. seed now (month of June) is beginning to pick up moisture with the humidity. Now is a good time to put it out to dry a bit. Pick a breezy day to dry out the seed, then plant. A problem with moisture content that is too low, seed can split (dicots); especially groundnuts. Must know dormancy period for every variety within a species.

T: Depends on time, month of harvest

PH: With correct handling, a crop can be brought in in the rain (ex. India).
Must explain to farmers, with a seed crop, why they should make the extra effort - it will increase price, etc.

T: 50% of the plant population is lost at young age (germination, viability of seed). Also pest and disease problems occur at a young stage of plant's life. What is it? moisture, management, handling, etc.?

PH: It's a case of eliminating each possible cause.

PH: Main constraint to farmers' income in The Gambia is price. This year farmers will suffer because the price will drop. Effects can be minimized.
Seed needs to be replaced; it gets tire, and picks up disease. Would not keep seed for more than five years. If farmer doesn't have money to buy new seed, it's possible to go in and select and save for seed.

TAO: M. Selection Methods, Harvest
threshing, before or after storage? If store first, tendency for wives, children to take it and sell or eat.

T: If on panicles, will have to pound, etc.

TAO: We're talking about seed (a small amount), not all stored products, which could easily be threshed upon harvest.

T: Maize stores best on the cob; hung up in the kitchen. No damage observed. Gets smoked when hung in kitchen.

PH: Also, when planted, the smoke acts as a seed dressing.

TAO: N. Sampling
Seed lot - all seed of a particular variety; an identifiable group of seed.
When to sample:
After harvest; when dry (normally done); other (before planting).
After drying, before processing; seed inspection - after bagged and stored for a time.
To encourage sampling before planting, until farmers are confident of the way seed is stored.

PH: depends on length of storage; if possible, two times if suspicious.
Groundnuts warrant testing in the spring. Why is sampling technique critical?

T: Do you certify bags; any bias in systematic sampling? ex. #1, 3 ok, but maybe #2 has variations.

PH: Random sampling is ok. The size of final sampling must be sufficient.
Labeling - farmer name, variety, location, date, sender, number of bags labeled.

Use cloth or plastic? It should be in linen bags. STU is to give each NGO a bag sample. NGOs to provide their own bags which can be re-used. (be sure to clean them first). They should be cleaned, not so much as a concern for pests, but so other seed varieties don't get mixed up with it.

TAO: O. Seed selection (processing or conditioning)
ex. millet - how to select for uniformity?
The stem borer is in the field; immediately before harvest must select out stem borer resistant crops.

T: A traditional method - 10% saline treatment.
Screening, thresh, winnowing, sieve; soak in water; extract floating, discolored seeds. Salt also treats seed. Need to rinse out the water, then dry the seed out.

PH: Better winnowing removes light kernels, other light seed. use of sieves or screens.
need a uniform process for selection.

TAO: P. Seed Storage

PH: some store in a heap, and use outside rice to protect inside.

TAO: Q. Equilibrium moisture content

Exercise: Analysis of Gambia Storage
(right column: storage type;
across the top: air flow, insects, rodents, water/moisture, cost, durability, observations)
Trainees provide input of their own observations of storage practices in The Gambia

TAO: R. Storage Insecticides:

actellic - proper application; mix; Farmers to not inhale too much.
malathion
fumigants, photoxin
neem leaves - dry out of the sun, powder the leaves; mix in thoroughly; rate: 3-5 g/kilo

Seed treatment:
Aldrix-T - fungicide
Super-homai
use at planting time.
Storage inspection - should be done on a regular basis.

v.Jenoi Notes

OUTLINE FOR THE PEANUT SEED EXPERIMENT FIELD DAY

Revised for AFSI Program
Departments of Bignona, Nioro
Field days to be held:
May 29-June 2, 1989

PURPOSE: The purpose of having the peanut seed field day includes the following:

1. To present and discuss the treatments and results of the peanut seed storage experiments.

2. To create an awareness among the participants concerning the peanut bruchid and a variety of potential ways to reduce the level of loss to this insect.

3. To receive feedback from the participants on the experiment, and the way they store peanut seed and to assess interest in trying any of the demonstrated storage methods.

4. To develop experience in presenting field days in preparation for future extension activities.

OBJECTIVES: As a result of this activity, participants (selected farmers and invited guests) will be able to:

1. Describe the principal problems associated with proper preservation of seed stocks of peanuts.

2. List the advantages and disadvantages of various forms of seed treatment and storage: early vs. traditional times of removal; application of insecticide (what, when, and safe use); use of sand, ash, or neem powder instead of insecticide; storage in bags vs. mud brick box.

3. Assemble materials and construct a mud brick box for storage; also demonstrate effective ways of preparing peanut seed with each of the following: ash, sand, neem powder, and commercial insecticide.

4. Calculate the relative costs of each method of treatment and storage on a per bag basis.

5. Understand the effects of various systems of storage and treatment on percentage of damaged vs. undamaged seed.

6. Discussion to answer questions as well as to understand experiences of other participants concerning other methods of peanut seed storage.

PARTICIPANTS: Individuals involved in this activity may include one or more of the following:

- o Peace Corps Volunteers working with OFSP
- o Representatives of NGOs and PVOs engaged in seed activities with farmers
- o Selected farmers from surrounding villages or a group of farmers from a single village
- o local government officials involved in related activities

MATERIALS: Label everything, if possible, in French, Arabic, Wolof (in French and Arabic script). Flipchart paper, magic markers, small bags, labels, insecticide supplies.

INCENTIVES: Organizers generate community interest in the field day or demonstration by: (a) posing a series of questions to be answered at the event; (b) requesting participants to make certain observations on which to report at the event; (c) generating competition, perhaps on which seed treatments will result in the highest percentage of viable seed (those familiar with the local situation can develop more relevant, more stimulating contests).

SITE: Hold each event at a site that meets following criteria:

(a) ease of access for bulk of participants;
(b) neutral ground if a variety of participants are expected;
(c) reasonable protection from sun or rain for participants and staff;
(d) tables or benches on which to erect displays and conduct demonstrations;
(e) access to drinking water and other creature comforts.

PRACTICE: Particularly for those expected to conduct similar demonstrations elsewhere, and for those having someone else conduct the presentation, so they will be familiar with the procedure. Provide time and opportunity for supervised practice sessions, perhaps letting the rest of the participants critique the performance.

DEMONSTRATION: Everything needed in the demonstration must be on hand, and, in many cases, in two forms:

1. Completed mud brick box; show materials needed to construct a box.

2. Supplies of ash, sand and neem in two forms: show how to prepare for use, and more already prepared for use in the demonstration.

3. Exhibits on tables with each treatment shelled, along with appropriate sign on the treatment used, result, costs, etc.

CONDUCTING THE FIELD DAY:

A. The display
The control and each treatment will be represented by:

1. The original bags and their contents

2. A small quantity of 2 kgs. in a plastic bag for farmers to handle

3. 200 seeds from each treatment divided into damaged and undamaged piles, labeled and put into small plastic bags that will be sealed and attached to each other for easy comparison of treatments (these bags will not be displayed until after initial discussions).

B. The directed discussion

1. Opening comments explaining the purpose of the field day and the experiment.

2. Discussion on the bruchid when it infests the peanuts and its life cycle. Also, therefore, the potential importance of early removal of peanut seed from the field.

3. Explanation of each treatment, its cost, and amount of labor involved in preparation:
- control
- Actellic: initial and monthly
- ash
- sand
- neem
- early and late removal
- mud brick box with Actellic

Also, explain that plastic bags were used so peanuts could be observed, and that they prevent leakage of treatments like sand.

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4. Explanation of preparation and application of each treatment
   - sand
   - ash
   - neem
   - Actellic - include how to handle pesticides safely

5. Ask farmers which treatment they feel will be most effective.

6. Display and discuss results of the treatments.

7. Group interview
Information gathering from participants. Be sure to record this data in a quantifiable form, i.e. numbers of farmers of the total that undertake each practice.

   1. If they are storing peanuts seed
   2. Kind of containers being used
   3. Treatment of seed with chemicals or other substances
   4. Satisfaction or problems with storage methods
   5. Elicit commitment from eligible participants to use one or more of the demonstrated processes in the harvest from the next cropping season.
   6. Need for assistance to do so.

CLOSING: This provides an opportunity to thank everyone for coming and cooperating, to generate discussion among farmers of their plans for the next crop, to elicit commitment to try new practices, and to identify anticipated constraints.

DOCUMENTATION AND FOLLOWUP: It is important for future field days to document the results of this one. Briefly describe
   1) your observations -
      what went well;
      what didn't go so well;
      villagers' comments
   2) recommendations for the future.

Did you have photos made of the key aspects of the event? These will be useful in future field days, reports and evaluations, as well as provide publicity after the fact. Pictures of the demonstration can be

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displayed in local public areas such as the sou-prefecture or CER offices.

Remember to write short thank you notes to all those who are particularly helpful.

List the names and addresses of farmers who said they would try the new methods. This is your primary follow up audience.

pnutdemo.vjl

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AFSI/OFSP Peanut Seed Storage Experiment

A Joint Activity of Winrock, International (On-Farm Seed Project)
and
Peace Corps / Senegal (AFSI program)

Introduction

One of the major seed problems facing farmers in Senegal and the Gambia is the high level of storage losses due to the groundnut seed beetle Caryedon serratus. This storage pest infests the peanuts after harvest while the crop is drying in the field. Even with a low level of initial infestation, losses of peanut seed after five months of storage routinely are 30%, though 80%-100% losses are not uncommon. Therefore, the initial seed storage experiments will focus on examination of various storage methods and treatments performed by the 12 AFSI volunteers in their villages to provide the basis of future extension efforts.

Concept

A variety of storage methods and treatments will be tested to better understand their advantages and disadvantages for use by farmers, i.e. cost, labor, availability of materials, etc. The basis of comparison of the different methods will be the germination test. The most important factor in successful seed storage is high quality seed for planting the next year; germination is one important mesure of seed quality. Additionally, demonstrations in the villages will compare the treatments based on observation of insect damage levels.

The experiments have been designed to examine the following hypotheses:

A. Prompt removal of the peanuts from the field vs. prolonged drying in heaps in the field

If the peanuts to be saved as seed can be dried off the ground to accelerate the drying process, removed from the field as soon as sufficiently dry for storage, and promptly stored, infestation, and thus storage damage, may be reduced.

B. Mud brick boxes

Though most of the experiments will be conducted with plastic bags, the mud brick box holds promise as a low-cost, locally available storage container.

C. Sand

Forty percent of stored peanut seed is air. The sand is used to fill up some of that air space, thereby reducing

oxygen supply for insects, and making it more difficult for insects to move about to feed and breed.

D. Ash

Ash particles are very sharp and may scratch the exoskeleton of the insects. Additionally, ash is hydroscopic and will therefore dessicate the insects after the exoskeleton has been scratched.

E. Neem

Neem leaves and fruit have insecticidal properities. Since neem grows in Senegal it will be tested as a potential seed storage insecticide.

F. Storage insecticides

Chemical insecticides are used in Senegal often without proper knowledge of what is being used or how it should be used. Chemical insecticides can be extremely cost effective in reducing storage losses if used properly. Actellic dust (2% pirimiphos-methyl) with a very low toxicity (LD50=2050) is widely used for peanut seed storage in Senegal and will therefore be included as the only chemical insecticide for the experiment. Treatments will be done with just an initial application of Actellic, which is the common practice, as well as a monthly application.

Peanut Seed Storage Experiment Instructions

Experiment Design

Experiment 1 -- Timing of Removal from the field and stoarge

Treatement	Description
Control	Traditional removal, no insecticide
1	Traditional removal, initial insecticide application
2	Traditional removal, monthly insecticide application
3	Early removal from field, no insecticide
4	Early removal, initial insecticide application
5	Early removal, monthly insecticide application
6	Traditional removal from the field, initial insecticide application, storage in mud brick box.

Experiment 2 -- Storage Insecticides

Treatment	Description
1	Traditional Removal from field, mixed with ash
2	Traditional Removal, mixed with sand
3	Traditional Removal, neem powder applied
4	(Experiment 1, treatment 1)
5	(Experiment 1, treatment 2)

All storage will be in 100 micron, 1.0 x 0.70 meter plastic bags at a cost of 240 CFA/bag.

The quantity of peanuts for each treatment will be 20 kgs.

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Preparation

The storage container

Large plastic bags have been chosen as the standard storage container because of cost (240 CFA/bag), ease of transport, minimum contamination from outside the bag, their availability in sufficient quantity, and because they will not allow the treatments (ash, sand, neem, chemical) to escape. On the other hand, plastic bags still present problems. They may be punctured through abrasion, sticks, stress on the bag, or rodents. Additionally, though the bags are available in Dakar, they are not available in rural areas. Extreme caution must be taken to avoid damage to the bags, to repair holes, or to put damaged bags inside another. Bags should be kept tightly closed with a cord or string and in such a way that prevents the entry of pests.

The mud brick box can be constructed of local materials at a minimum of cost, but providing a high degree of protection for the seed. The results of the experiments this year will provide us with the basis for further examination of this technology in the future.

Mud block construction is widely practiced in Senegal and the Gambia. A mud block box is also a seed storage container that has promise because it is cheap, built of local materials, provides good protection against insects and rodents, and prevents petty theft of the seed peanuts. A storage box constructed and used by a farmer in the Gambia appeared to provide very effective seed storage. Therefore, a mud block storage box will be included in our experiment because of its advantages over other kinds of storage containers.

A. Box size: A relatively small box is required since only 20 kg of peanuts need to be stored. Though dimensions can vary due to the space available, the inside dimensions should approximate 50 cm length, width, and height. The 20 kg peanuts should completely fill the box.

B. Box location: The box observed in the Gambia was in a bedroom though any room with solid walls and floor is suitable. The box was built in a corner so that only 2 walls were necessary to complete the box. Locations that may get wet either from a leaky roof or a damp floor should be avoided.

C. Box construction:

1. The mud blocks should be very dry, solid, and relatively uniform.
2. The mud mortar should completely fill the space between the blocks leaving no wide cracks, holes, or spaces.

3. There should be a layer of blocks on the bottom of the box for extra protection from insects and moisture migration from the floor.
4. The inside and outside of the box should be plastered smooth to eliminate hiding places for insects and promote better sanitation.
5. The box must be completely dry before it is used. This will take an extended period of time because the box will be inside where temperatures, sunlight, and air circulation are less. THE BOX SHOULD DRY AT LEAST 1 MONTH; THE LONGER THE BETTER. CONSEQUENTLY, THE BOX CONTSTRUCTION SHOULD BE ONE OF THE FIRST THINGS YOU DO IN PREPARATION FOR THE STORAGE EXPERIMENT. A lamp placed inside the box will promote drying though it should dry naturally for a week or so to prevent the cracking that rapid drying can promote.
6. Work in teams with other PCVs on the box construction along with a local mason.
7. Costs incurred in the box construction will be reimbursed though you must provide a receipt.

Storage Location

Explanation to the village: It should be made very clear to the villag that we are conducting an experiment to understand different methods of peanut seed storage that small farmers can use. If assistance is needed to make this understood, contact Alan.

Location of the storage experiment should approximate the normal storage conditions that exist in the village. Finding a place to put nine plastic bags and a storage box is no small task.

Access: you will need to have access to the bags on a regular basis (at least once a week). Additionally, the bags should be placed so that you can physically inspect them.

Sanitation: The storage location should be reasonably clean to avoid punctures or attracting rodents. Damage to the bags should be repaired immediately.

Peanuts for the experiments

Peanuts should be of the same variety at each location. The peanuts should be from the same field and harvested at the same time (approximately). The peanuts should be taken from various areas of the field and mixed together before they are divided into the 20 kg storage quantities. The purpose for this is to

have a representative sample of the field that will have a uniform infestation level by the groundnut weevil.

Purchase of peanuts: To avoid any risks to the farmer or other problems, the peanuts for the experiment will be purchased by OFSP. You will be furnished with sufficient funds to purchase 200 kgs of peanuts for which a receipt will be required. At the conclusion of the experiment the peanuts will be sold in an appropriate manner in order to establish a revolving experiment fund from which to finance future activities.

Early removal from the field

The primary means of infestation by the Caryedon serratus is in the field. Therefore, timely removal of the peanuts should reduce infestation levels. In order to test this assumption, 60 kg of peanuts will be removed from the field as soon as a safe moisture content for storage is reached. This moisture content is 9 percent.

Peanuts are normally harvested when the lower leaves turn yellow and drop off (Refer to "Pest Control in Groundnuts, pp. 155-158, 179-180). At this point the moisture content of the peanuts is around 40-45 percent. Traditionally, the peanuts are left in windrows for a few days before being transferred to small piles and then to larger piles. The date of final threshing depends to a great extent on marketing, which normally begins in late December or early January. The traditional removal time from the field this year may be more timely than usual because of late planting and rains. Therefore, you must accelerate the drying process for the early removal treatment of 60 kgs of peanuts so that there will be a significant time difference between the early removal and traditional removal from the field of at least two weeks. Four weeks or more would be better.

There are several strategies to hasten drying. Keep the peanuts in smaller piles. Dry the peanuts on racks or platforms to promote air circulation. Fianlly, remove the peanuts from the plants when they reach 15 percent and dry them on racks or mats.

Care must be taken in threshing of all peanuts used in the experiment to avoid damage that will affect germination.

In the early removal or traditional harvest peanuts, it is extremely important that the peanuts be a 9 percent moisture content before storage in plastic bags since moisture buildup is a potential problem in semi-sealed bags.

Determining Moisture Content of the Peanuts

Approximate moisture content can be determined by traditional methods: visual, feeling, chewing, and crushing. With practice these methods can be quite accurate. Because most of the storage will be in plastic bags, moisture content of the peanut is critical. Therefore, moisture meters have been provided to each region. Peter Henderson of the Seed Technology Unit in the Gambia has tested the moisture meter over the last month and has found it to be extremely accurate. We have used the moisture meter during the PST and IST, so you have some experience with it.

1. In each region determine a central location where the moisture meter can be kept. Though I suggest you keep it at one location and bring the samples to it, you may find a sign out system to be acceptable as well.

2. Read the instruction manual for the moisture meter and become familiar with its operation.

3. Practice using the moisture meter on the various crops at harvest time and develop a way to measure in the field the amount of seed necessary to test.

4. Keep the meter reasonably clean.and out of the direct sunlight for extended periods of time.

5. Use the Virginia Peanuts conversion chart for the varieties here. The short-med rice varieties should be used for the rice varieties here; the milo conversion chart should be used for millet. Maize moisture content is read with a conversion.

Labeling: A magic marker should be used to write on each plastic bag as well as a tag inside the bag that identifies the treatment. The bags are much easier to write on before they are filled.

Preparation of Neem Fruits:

The neem kernel contains the highest concentration of active ingredients. Therefore, the kernels (seeds) should be separated from the fruit and dried on the screen in the sun. After the seed coat is removed, the kernels should be further dried in the shade. Becuase of high oil content of the kernels, extensive drying or roasting will be necessary before they can be crushed

into a powder. Dryed kernels or powder should be stored in a sealed container to preserve the active ingredients. Documentation of your efforts to develop methods for making neem powder will be appreciated.

Collection of Ash:

Using the screen, separate the large particles from the ash and store it in a moisture proof container (plastic bag). Two buckets of ash will be necessary for the experiment.

Collection of Sand:

Fine sand that is clean and totally dry is needed for the experiment. To remove silt and clay, the sand may be washed since silt and clay will be suspended in the water while the sand will immediately settle to the bottom of the bucket. Use the screen to sift the sand.

Conducting the Experiment

Sampling:

Two initial samples of 1 kg each will be taken before storage. One sample from the early removal from the field peanuts and one sample from the traditional field removal. It is very important that the samples be representative of the entire amount of peanuts to be stored. Therefore, many single handfuls of peanuts should be taken from throughout the peanut pile, i.e. top, middle, bottom,, and edges. Those handfuls should be mixed and the 1 kg sample should be taken from that. The remaining peanuts should be returned to the pile. The sample will then be bagged and properly labeled --- name, date, location, variety, early removal or traditional removal --- and transported according to the germination procedure which will be developed shortly.

Application of the Treatments:

Application of insecticide: The technique that we agreed upon at the IST was to apply the insecticide in layers in the bag, shaking the bag after each layer. The quantity of Actellic is 10 grams/20 kg, which is one half a match box. Close the match box to 2-3 mm for a more even application. The in-the-bag layer technique provides better coverage, less loss of the insecticide, and minimizes damage to the peanuts.

Mixing sand with peanuts: The technique that has proven most effective is the following:

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1. Pour two buckets of peanuts into a double plastic sack.
2. Slowly pour a bucket of sand into the bag, making sure there is an even distribution of sand throughout the peanuts and in the corners.
3. Add another bucket of peanuts and sand making sure an even distribution of sand is achieved.
4. Add the final bucket of peanuts and add the sand until all the peanuts are covered and there is a uniform layer of sand on top.

Mixing ash with peanuts: Because ash is extremely light, it will not flow between the peanuts like sand does. Therefore, the basic technique will require layering of peanuts and ash. Additionally, pouring of ash is not advised because of the dust it will create. Instead, a can or cup should be used to apply the layers. Approximately two buckets or more of ash will be necessary to cover and fill most of the space between the peanuts. Total filling of the space between the peanuts will not be possible because ash will not flow into spaces like sand.

1. Start with a layer of ash in the bag and add a layer of peanuts (1/3 of a bucket).
2. Add alternating thin layers of peanuts and ash to create uniform coverage of the peanuts by the ash.
3. The last layer of peanuts should be well covered by ash.
4. An alternative strategy to getting uniform coverage of the peanuts would be to put one bucket of peanuts and 1/2 bucket of ash in a bag and shake vigorously. Then to load the bag with this mixture. Some experimentation will be required to achieve to optimum results.

Application of neem powder: The neem powder can be applied in the same manner as the Actellic to create uniform coverage of the peanuts by the powder. Application rates will depend on the particle size of the neem powder. With very small particle size even coverage can be obtained with less neem powder than if the particles are much larger. Because of the high oil content of the neem seed, creating a fine powder may be difficult with local technology. Therefore, application rates will not be determined until the powder has been produced. Previous storage experiments by Dogo Seck have used 5 grams neem/ kg of cowpeas. Other experiments have used rates of 1%-2% neem powder by volume with wheat. Therefore, the recommendation is to use the highest rate possible given the difficulties in producing the powder: perhaps 200 grams - 1000 grams per 20 kg of peanuts. Work together in each region and establish a standarized preparation method and application rate so that comparisons between locations can be made.

Loading the mud brick box: The peanuts should be treated with Actellic in a bag as previously explained for even distribution of the insecticide. An additional five grams (1/4 match box) should be used to sprinkle the bottom and walls of the mud box; after the peanuts are dumped in bulk into the box, sprinkle a layer of dust on top of them, too. A minimum of space should remain after the box is filled with peanuts. The top should be constructed by the most appropriate means, i.e., a layer of sticks with mud on top, bricks with a mud plaster, or possibly a layer of plastic on the peanuts before the top is constructed over it. Try to minimize the exposure of the peanuts to damp mud plaster.

Monitoring

The experiments will need to be closely monitored to correct problems as they occur. There are two potential problems that will require constant vigilance.

Moisture build-up - Because plastic bags do not allow for air circulation and continued drying after storage, it is critical that the peanuts be at or below 9% moisture content before storage. Check all bags daily during the first week or two after storage. Open the bag to check for musty odors, plunge your hand into the bags (except for sand and ash treatments) to detect heat build-up, look for any moisture forming on the inside of the bag. If you detect a problem re-dry the peanuts immediately.

Rodents - Since rodents can easily penetrate the plastic bag they pose a major problem for the experiment. Direct loss to rodents is not a problem, but the holes they make will allow the entry of storage insects. Initial or small holes should be patched followed by the use of rodent prevention measures around the bags. Badly damaged bags should be placed inside another bag.

Data sheet - Accurate records on the experiments are essential. A data sheet will be kept for each treatment with the essential information about the treatment. Additionally. observations and comments will be recorded concerning each treatement during the storage period, for example, insect activity, rodent damage, moisture build-up, etc.

Data Sheet

PCV _____ Village _____

Location of Storage Experiment _____

Treatment _____

Date of Harvest _____

Date of Removal from field _____

Date of Storage _____ Moisture content _____

Visual seed test after storage:

% whole seed _____ % damaged seed _____

Germination at storage _____

Germination after storage _____

Observations:

Extension

The potential extension benefits of the experiment are a good start for the AFSI program.

1. The visit by the APCD AFSI and MDR counterpart will bring attention to the activities of the local volunteers. Additionally, the explanation and activitiy of the volunteers will orient and inform the farmers on AFSI's initial activities. It must be emphasized that these are experiments from which we will learn. This will start to create an awareness of our interest in seed and storage problems and in exploring both traditional and improved solutions to those problems.

2. That awareness may help to open farmers up to explain their own techniques and experiences in seed and storage problems.

3. Because the experiment creates excellent bait for rodents, we will be able to better understand the extent of the rodent problems, effectiveness of rodent proofing and sanitation, as well as use of traps, poisons, rat stop, etc. As part of improving storage by reducing losses to rodents you should first determine what is available locally and regionally for rodent control. For example, I'm interested in Lynn's situation if the cats continue to control the rodents. What kind of traps are available.

The first line of defense is sanitation and rodent proofing. You should be ready to place traps at the first sign of rodent attack. If traps are effective, that is important for us to know. If traps are ineffective, be ready to implement other methods, such as rat stop. Rat poisons should be used only as a last resort. Our experience in the area of rodent control will provide a basis for future extension efforts. Expenses involved in traps, rat stop, etc. will be covered by OFSP.

4. A field day will be organized at the end of the storage period during which the farmers can observe the various treatments and the results of those treatments. Though germination tests will be useful for us, the most effective demonstration will be shelling a kilogram of sample peanuts from each treatment and separating damaged and undamaged grains for farmers to observe. We will establish the details of the field day well in advance.

Appendix F.

AFSI/OFSP
PEANUT SEED STORAGE TRIALS

SUMMARY TABULATION OF RESULTS

The following tables summarize findings for all samples from every field removal and storage treatment group. See accompanying table for listing of results for individual samples. The figures below are simple averages.

Overall Averages Averages for all samples combined

Removal / Treatment	GERMINATION (%) Initial	Final	Δ	WHOLE SEED	DAMAGED SEED (%) Bruchid	Mold
All	58	73	16	74	22	4

SORTED BY INITIAL GERMINATION

Removal / Treatment	GERMINATION (%) Initial	Final	Δ	WHOLE SEED	DAMAGED SEED (%) Bruchid	Mold
Early/Actellic	70	84	14	92	3	2
Early/None	70	64	-6	66	31	2
Trad./Actellic/Box	53	62	9	81	14	5
Trad./Ash	52	84	32	84	11	5
Trad./Sand	52	81	29	93	3	4
Trad./Neem leaf	52	68	16	50	46	3
Trad./None	52	58	6	28	69	2
Trad./Actellic	52	82	30	94	1	5

SORTED BY FINAL GERMINATION

Removal / Treatment	GERMINATION (%) Initial	Final	Δ	WHOLE SEED	DAMAGED SEED (%) Bruchid	Mold
Early/Actellic	70	84	14	92	3	2
Trad./Ash	52	84	32	84	11	5
Trad./Actellic	52	82	30	94	1	5
Trad./Sand	52	81	29	93	3	4
Trad./Neem leaf	52	68	16	50	46	3
Early/None	70	64	-6	66	31	2
Trad./Actellic/Box	53	62	9	81	14	5
Trad./None	52	58	6	28	69	2

SORTED BY % OF WHOLE SEED REMAINING AFTER STORAGE

Removal / Treatment	GERMINATION (%) Initial	Final	Δ	WHOLE SEED	DAMAGED SEED (%) Bruchid	Mold
Early/Actellic	70	84	14	92	3	2
Trad./Ash	52	84	32	84	11	5
Trad./Actellic	52	82	30	94	1	5
Trad./Sand	52	81	29	93	3	4
Trad./Neem leaf	52	68	16	50	46	3
Early/None	70	64	-6	66	31	2
Trad./Actellic/Box	53	62	9	81	14	5
Trad./None	52	58	6	28	69	2

SORTED BY % DAMAGED BY BRUCHIDS DURING STORAGE

Removal / Treatment	GERMINATION (%) Initial	Final	Δ	WHOLE SEED	DAMAGED SEED (%) Bruchid	Mold
Trad./None	52	58	6	28	69	2
Trad./Neem leaf	52	68	16	50	46	3
Early/None	70	64	-6	66	31	2
Trad./Actellic/Box	53	62	9	81	14	5
Trad./Ash	52	84	32	84	11	5
Trad./Sand	52	81	29	93	3	4
Early/Actellic	70	84	14	92	3	2
Trad./Actellic	52	82	30	94	1	5

Title

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3												
4									-----(% of sample)--------			
5			GERMINATION (%)						WHOLE	DAMAGED SEED		
6	Code	Remov.	Treatment		Initial	Final	Δ		SEED	Bruchid	Mold	
7												
8	NA1	Trad	None		*	58			9	91	0	
9	NA2	Trad.	None		87	60	-27		6	93	0	
10	NA3	Trad.	None		6	54	48		8	89	3	
11	NA4	Trad	None		21	22	1		12	88	0	
12	NA5	Trad	None		69	49	-20		13	87	0	
13	BA1	Trad.	None		*	59			27	71	2	
14	BA2	Trad	None		67	98	31		90	6	4	
15	BA3	Trad	None		69	76	7		49	48	3	
16	BA4	Trad	None		47	45	-2		41	53	6	
17	NB1	Trad	Actellic		*	75			93	0	7	
18	NB2	Trad.	Actellic		87	75	-12		96	0	4	
19	NB3	Trad	Actellic		6	72	66		92	0	8	
20	NB4	Trad	Actellic		21	75	54		96	0	4	
21	NB5	Trad	Actellic		69	87	18		98	1	0	
22	BB1	Trad	Actellic		*	86	86		89	4	8	
23	BB2	Trad	Actellic		67	98	31		94	0	6	
24	BB3	Trad	Actellic		69	--			--			
25	BB4	Trad	Actellic		46	91	45		95	0	5	
26	ND1	Early	None		82	88	6		92	0	8	
27	ND2	Early	None		76	90	14		93	6	1	
28	ND3	Early	None		*	0			0	100	0	
29	ND4	Early	None		49	83	34		97	0	3	
30	ND5	Early	None		82	82	0		95	3	3	
31	BD2	Early	None		70	95	25		96	2	2	
32	BD3	Early	None		55	0	-55		0	100	0	
33	BD4	Early	None		74	71	-3		57	41	3	
34	NE1	Early	Actellic		82	87	5		94	6	0	
35	NE2	Early	Actellic		76	78	2		99	0	1	
36	NE3	Early	Actellic		*	81			91	0	9	
37	NE4	Early	Actellic		49	79	30		95	0	5	
38	NE5	Early	Actellic		82	81	-1		97	0	3	
39	BE1	Early	Actellic		75	79	4		74	15	1	
40	BE2	Early	Actellic		70	92	22		97	1	1	
41	BE3	Early	Actellic		55	96	41		94	3	1	
42	BE4	Early	Actellic		74	86	12		93	0	0	

	A	B	C	D	E	F	G	H	I	J	K	L
43	NG1	Trad.	Actellic-box		*	79			96	0	4	
44	NG2	Trad.	Actellic-box		87	74	-13		99	0	1	
45	NG3	Trad.	Actellic-box		6	77	71		92	8	0	
46	NG4	Trad.	Actellic-box		21	49	28		96	0	4	
47	NG5	Trad.	Actellic-box		69	81	12		96	1	3	
48	BG1	Trad.	Actellic-box		*	40			72	10	17	
49	BG2	Trad.	Actellic-box		67	70	3		29	70	2	
50	BG3	Trad.	Actellic-box		69	27	-42		65	27	7	
51	NH1	Trad.	Ash		*	89			95	0	5	
52	NH2	Trad.	Ash		87	99	12		95	0	5	
53	NH3	Trad.	Ash		6	90	84		94	0	6	
54	NH4	Trad.	Ash		21	75	54		95	0	5	
55	NH5	Trad.	Ash		69	85	16		95	0	5	
56	BH1	Trad.	Ash		*	80			90	2	8	
57	BH2	Trad.	Ash		67	83	16		35	63	1	
58	BH3	Trad.	Ash		69	81	12		62	36	2	
59	BH4	Trad.	Ash		47	76	29		93	0	7	
60	NI1	Trad.	Sand		*	87			96	0	4	
61	NI2	Trad.	Sand		87	89	2		97	0	3	
62	NI3	Trad.	Sand		6	86	80		93	0	7	
63	NI4	Trad.	Sand		21	53	32		96	0	4	
64	NI5	Trad.	Sand		69	89	20		96	0	4	
65	BI1	Trad.	Sand		*	83			90	4	6	
66	BI2	Trad.	Sand		67	66	-1		92	6	2	
67	BI3	Trad.	Sand		69	93	24		88	8	3	
68	BI4	Trad.	Sand		47	87	40		88	9	3	
69	NJ1	Trad.	Neem leaf		*	60			5	91	4	
70	NJ2	Trad.	Neem leaf		87	63	-24		8	92	0	
71	NJ3	Trad.	Neem leaf		6	91	85		22	74	4	
72	NJ4	Trad.	Neem leaf		21	92	71		92	1	7	
73	NJ5	Trad.	Neem leaf		69	65	-4		26	74	0	
74	BJ1	Trad.	Neem leaf		*	66			38	60	3	
75	BJ2	Trad.	Neem leaf		67	94	27		91	5	4	
76	BJ3	Trad.	Neem leaf		69	8	-61		77	20	3	
77	BJ4	Trad.	Neem leaf		47	73	26		92	1	6	
78	NK2	Trad.	Neem seed		87	76	-11		96	2	3	
79	BL2	Trad.	Ash - Box		67	16	-51		69	21	10	
80												
81	**Overall Averages**				**58**	**73**	**16**		**74**	**22**	**4**	
82												

Note for cell A6:
Here's the code. N = Nioro, B = Bignona;
For Nioro samples:
1 = Beth 2 = Joe 3 = Randy 4 = Roger
5 = Tracy
For Bignona samples:
1 = Donna 2 = Karongue 3 = Mark 4 = Mary The letter in the middle is just an identifier for that particular remo

Note for cell K11:
Earlier version of this table had 88% loss in mold column. I've since confirmed with DPCS that the damage was ac

Note for cell A24:
DPCS lost this sample.

Note for cell A32:
This sample had 100% loss to bruchids.

Appendix Q.

ACRONYMS

AID	Agency for International Development
GOS	Government of Sénégal
GOTG	Government of the Gambia
ISRA	Institut Sénégalais de Recherche Agronomique
STU	Seed Technology Unit
AFSI	African Food Systems Initiative
APS	Agricultural Support Project (USAID/Sénégal)
CRS	Catholic Relief Services
MSU	Mississippi State University
The Center	Joint PVO/University Rural Development Center
Winrock	Winrock International Institute for Agricultural Development
PVC	USAID Office of Private and Voluntary Cooperation
FAVDO	Forum of African Voluntary Development Organizations
PACT	Private Agencies Collaborating Together
APDC	Associate Peace Corps Director
CONGAD	Conseil des Organizations non-gouvernementales en appui au Développement
FONGS	Féderation des Organizations non-governementales
FAO	Food and Agriculture Organization